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CR-142180

CARTOGRAPHIC EVALUATION OF SKYLAB S-192 SCANNER IMAGES

EREP Investigation Number 497

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Period Covered: 1 November 1974 - 31 January 1975

NASA Purchase Order T-4111B
Principal Investigations Management Office
Lyndon B. Johnson Space Center
Technical Monitor: Rigdon Joosten, Code TF6

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Quarterly Progress Report

(E75-10156)	CARTOGRAPHIC EVALUATION OF	N75-19780
SKYLAB S-192 SCANNER IMAGES	Quarterly	
Progress Report, 1 Nov. 1974 - 31 Jan. 1975		
(Geological Survey, Reston, Va.)	7 p HC	Unclass
\$3.25	CSCL 08B G3/43	00156

Publication Authorized by the Director, U.S. Geological Survey

(a) Overall Status

Since the last quarterly report (1 August 1974 - 31 October 1974)
the following data have been received:

<u>Data</u>	<u>Task Site</u>	<u>Location</u>	<u>Date Received</u>
SL3 S-192 bands 3,5,7 conical & line straightened Prod 55-1	933699	Chesapeake Bay	Nov. 12, 1974
SL4 S-192 bands 4,7,9 Prod 55-1	933136	San Francisco	Nov. 21, 1974
SL4 S-192 bands 4,7,9 Prod 55-1	933548	Southern California	Nov. 21, 1974
SL4 S-192 bands 4,7,9 color composite Prod 55-3	933136	San Francisco	Dec. 3, 1974
SL4 S-192 bands 4,7,9 color composite prod 55-3	933548	Southern California	Dec. 3, 1974
SL4 S-192 bands 4,4,6,6,7,7 11,11,12,12,13-2, 13-2, 8,9, 13-1	933136	San Francisco	Jan. 13, 1975
SL3 S-190B 2x Transparencies Mag 83 150/173	933548	Southern California	Nov. 25, 1974

<u>Data</u>	<u>Task Site</u>	<u>Location</u>	<u>Date Received</u>
SL3 S-190B 2x Transparencies Mag 86 294/305	933699	Chesapeake Bay	Nov. 25, 1974
SL4 S-190B 2x Transparencies Mag 93 206/213	933396	Sioux Falls	Jan. 9, 1975
SL4 S-190B 2x Transparencies Mag 92 333/344	933136	San Francisco	Jan 9, 1975

The above S-192 imagery is the first to be received that looks adequate for the experiment. In particular, the imagery for Task site 933136 San Francisco and 933548 Southern California looks excellent. The film has been screened and the 7 1/2-minute topographic maps that cover the areas are being selected. Further work for this investigation will be limited to these two Task sites. The Task site 933669 Chesapeake Bay imagery is of low contrast and therefore not useable for this experiment.

The only significant progress to report at this time is the receipt and screening of the S-192 imagery.

(b) Action Required

The present period of performance for the investigation is until March 31, 1975. On January 20, 1975 a request to extend the period of performance to June 30, 1975 was sent to the Technical Monitor. This extension is the minimum required to complete the major objectives of the experiment.

(c) Expected Accomplishments During Next Reporting Period

Based on an extension of the period of performance to June 30, 1975 a revised mile stone schedule and task descriptions have been prepared for the investigation (copy enclosed). Assuming no major problem in the measurement program all of the point measurements should be completed during the next reporting period along with some of the preliminary analysis.

(d) Significant Results

None

(e) Summary Outlook for Remaining Effort

With the time remaining for this investigation the primary focus will be on the measurements and analysis of the cartographic accuracy of the S-192 imagery received from NASA. Based on these measurements and this analysis a decision will be made as to whether a more comprehensive study including computer modelling of the S-192 scanner geometry is warranted. If the decision is to do the further study an additional extension of the period of performance will be requested.

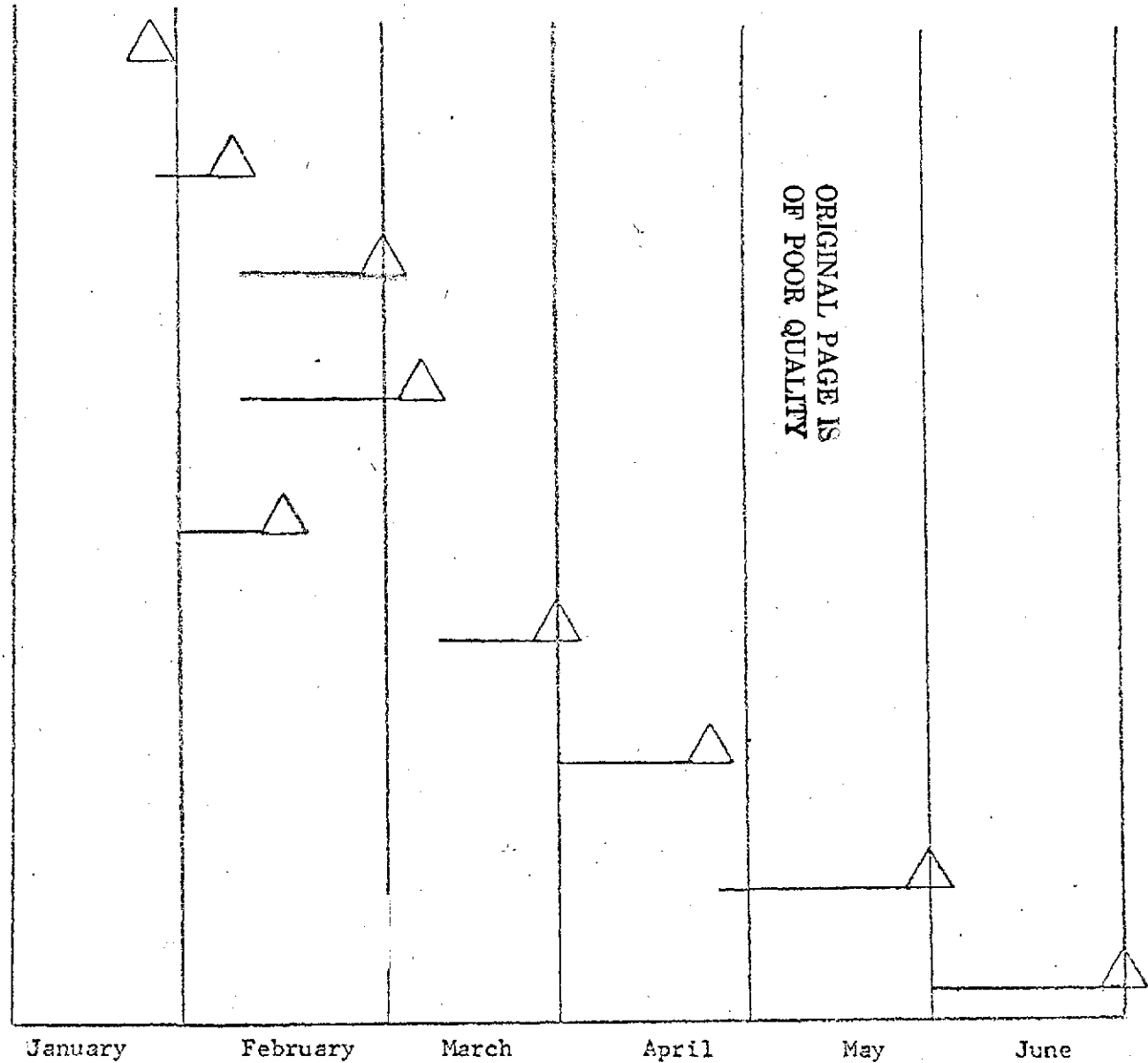
(f) Travel Summary and Plans

No travel was done by the PI for this Investigation during the reporting period and none is planned for the next quarter.

Skylab EPED Investigation No. 497

Milestone Schedule

1. Acquire maps for San Francisco and Imperial Valley test sites
2. Select image points for testing black and white and composites
3. Derive ground coordinates for test points
4. Measure image coordinates of test points
5. Select computer programs for processing
6. Do initial data processing and generate vector plots
7. Complete preliminary analysis and decide if more detailed study is warranted*
8. Prepare first draft - Final Report
9. Review and complete Final Report



*If a more detailed study is warranted a time extension will be requested

Skylab EREP Investigation No. 497

Task Description

1. Acquire maps for San Francisco and Imperial Valley test sites.
The most recent 7½ minute quadrangles covering the two test sites will be identified and copies of the appropriate maps will be pulled from the RT-F files. The San Francisco and vicinity 1:125,000 scale topographic maps and the south half of the California state base at 1:500,000 scale will also be used for orientation.
2. Select image points for testing black and white and color composites.
For each test site the materials received from NASA include black and white copies of single bands and a color composite of bands 4, 7 and 9. Image points that can also be located on the maps will be selected and marked on the imagery and the maps for the best black and white band and the color composite for each of the two test sites. Skylab S-190A and S-190B photographs of the test sites are also available as an aid in selecting control points. Approximately twenty-five well distributed points will be selected for each test site.
3. Derive ground coordinate for the test points.
Either the Data grid digitizer or a coordinatograph will be used to measure coordinates of all test points and UTM ticks on the maps. Computer processing will be required to derive the final UTM coordinates for the points.
4. Measure image coordinates of the test points.
The image points and the scan line tick marks on each image will be measured on a Mann comparator. Four sets of measurements should be made for each image. For this experiment a total of four different images will be measured.
5. Select computer programs for processing
Computer programs from those available in RT will be reviewed and the best one for this experiment will be used. The program must be capable of performing a linear transformation and polynomial transformations of different degrees. The final output will include transformation parameters, transformed positions, residuals and a calcomp vector plot of the residuals.

6. Do initial data processing and generate vector plots.
The data will be processed through the program and the vector plots will be generated.
7. Complete preliminary analysis of results and determine if a more detailed study is warranted.
The analysis will determine the cartographic potential of the S-192 multispectral scanner images. This will include the accuracy of locating points and of making measurements on the images. Any systematic errors in the imagery will be identified for possible use in developing correction algorithms. There will be no attempt during this phase of the experiment to develop a computer program to use spacecraft attitude to improve the geometric quality of the imagery. As a result of the preliminary analysis a decision will be made whether a more detailed analysis including computer modeling of the scanner geometry is warranted. If the decision is to conduct additional studies NASA will be requested to extend the investigation.

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OF POOR QUALITY