



United States Department of the Interior

GEOLOGICAL SURVEY
EROS Data Center
Sioux Falls, South Dakota 57198

NOAA file

IN REPLY REFER TO OC 1-8

January 29, 1988

Mr. Mike Mignogno
Acting Chief, Landsat Operations Division
NOAA/Goddard Space Flight Center
Building 28, Code 435.7
Greenbelt, Maryland 20771

Dear Mike:

Enclosed is the EROS Data Center Landsat data handling and processing report for the first quarter, Fiscal Year 1988.

I would be happy to discuss any questions or comments you may have.

Sincerely,

Allen H. Watkins
Chief, EROS Data Center

Enclosure

cc: G. Landis
R. Pohl
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GGMetz/mle/x6125/1-28-88

EROS Data Center
Landsat Data Handling and Processing
Quarterly Report

First Quarter, Fiscal Year 1988

The EROS Data Center (EDC) operates the final data processing, data archiving, product generation, and distribution portion of the Landsat ground segment on a cost-reimbursable basis for the National Oceanic and Atmospheric Administration (NOAA) and the Earth Observation Satellite Company (EOSAT), the Landsat commercial operator. This report summarizes the Landsat-related activities performed during the first quarter of FY 1988. Included in the attachment are Landsat data processing, production, and distribution statistics, sales summaries, and customer profiles.

1. Data Receipt and Processing

Both the Domsat and Decnet links used for transmitting MSS high density image data and other related MSS and TM information between GSFC and EDC continued to perform satisfactorily. EDC continued to consolidate incoming high-density image data which averages about 20 scenes per tape to minimize the number of high density tapes required for archive storage. EDC currently stacks 40-50 MSS scenes per tape.

Start of the three hour Domsat transmission period was changed from 0500 CST to 1800 CST to improve operations efficiency at both EDC and GSFC.

During the quarter, EDC received 7,227 and cataloged 8,009 scenes (included backlog from previous quarter) of Landsat MSS data. EDIPS pipeline run time was 427 hours to process 8,009 scenes of MSS digital data to archive black-and-white film.

97% of the MSS data was assessed good or fair; the primary reasons for MSS downgrade were salt-and-pepper noise and saturated data. MSS backlog at the end of the quarter was 58 scenes.

A total of 1,188 scenes (included scenes rejected at GSFC) of TIPS TM film data were received and 1,003 scenes cataloged and processed into the archive, bringing the total to approximately 20,170 film scenes. 88% of the TIPS film data were assessed good or fair; the primary reasons for downgrade were radiometric sensor response and sensor striping. EDC and GSFC personnel continued to work together on TM processing and inspection criteria and procedures to maximize TM film availability and quality. The TM film backlog at the end of the quarter was 0 scenes. A total of 365 scenes of digital CCT data was also added to the

archive, bringing the total TM CCT archive to 5,079 scenes (4,807 corrected and 272 uncorrected scenes).

The agreement among EDC, NASA, and NOAA for shipping the historical MSS WBVT's and critical components of the processing systems to EDC for storage and possibly low throughput processing was finalized and started through the signature cycle. EDC operations and maintenance personnel visited GSFC for system training. EDC software personnel also visited GSFC to determine if the Sigma V process could be replaced with a more efficient process using existing EDC hardware and modified software.

2. Archive and Data Base Generation and Maintenance

Approximately 39,000 frames of MSS and TM archive film were added to the Landsat archive, which totals 847,498 scenes and georeference accessions in the computerized data base (Main Image File). Foreign accessions reflected in the international data base at the end of the quarter which total 1,603,148 include: Brazil - 79,266; ESA (Italy, Maspalomas and Sweden) - 805,958; Canada - 415,708; South Africa - 45,723; Australia - 136,712; Argentina - 10,790; and Japan - 108,991. Also referenced in the EDC data base are 113,178 TM scenes that exist on HDT at GSFC.

3. Customer Interface

Landsat orders averaged 346 per month resulting in shipped Landsat product sales of \$2,237,123 for the quarter, an increase of \$59,363 over last quarter. This increase in sales revenue was for digital data products.

Landsat data acquisition requirements for the Basic Data Set, the U.S. Department of Agriculture, and other Federal and non-Federal users were consolidated at EDC and sent to GSFC for data acquisition scheduling. Revenue from cloud cover surcharges this quarter amounted to \$48,400, a decrease of \$145,200 over last quarter.

The monthly and quarterly micro catalog updates for Landsat MSS and TM coverage (approximately 869 sheets) were reproduced and issued. Over 8,340 frames of Landsat MSS and TM data coverage were microfiched, reproduced, and issued.

4. Product Generation and Distribution

Approximately 50,600 black-and-white (includes EDIPS MSS masters, TM masters, intermediates, and final user products) and approximately 1,070 color (includes color intermediates and final user products) photographic products were processed by the EDC photographic laboratory. Approximately

3,000 of these were photographic products distributed to users.

A total of 2,221 Landsat digital products, including floppy disks and CCT's generated from EDIPS, CCT's reproduced from the EDC archive, and retrospective CCT's generated by GSFC and reproduced by EDC, were distributed to users.

Average turnaround time for product orders was six days. Specific product turnaround times are reflected in the attachment.

All software and procedure modifications were completed for production of TM floppy disk products. Product codes and prices were added to the system and some of the sample products were finished. The system is scheduled to be ready for production of customer requested areas January 15, 1988.

5. Miscellaneous

Software development modifications completed for Landsat data handling and processing and customer services included: AROT/ASIT and Landsat request system changes needed for switch from Landsat 4 to 5 for TDRSS related data acquisition; change to convert latitude and longitude to degrees, minutes, seconds format and make a hardcopy of nominal Landsat scene centers; correction of a MIFKEEPER restart problem; LR10 and ASIT change to correct how standing product requests are checked and statused as new ASIT info enters the system; and TM floppy disk changes which include ability to convert lat/long coordinates to TM scene line/sample coordinates, extract window of interest, and format the header and image data for output to floppy disk.

Engineering analysis support continued to improve color film recorder operations and products. The color recorder was down for the week of November 2nd to convert from 2445 4-mil based to 2445 7-mil based color film. Agency response to the thicker 7-mil based film was very good.

Effort continued to maintain all of the Interface Control Documents (ICD's) between EDC and GSFC up-to-date. A waiver to ICD 2801 (which establishes TM film specifications and rejection criteria) to increase uniformity tolerance from .10 to .13 was agreed to. Relaxing the uniformity tolerance should decrease the number of TM film scenes rejected and improve throughput at GSFC.

Technical support was provided to bi-weekly Landsat telecons and interface meetings between EDC and GSFC, the eleventh Landsat Technical Working Group meeting, and meetings with EOSAT regarding customer services related activities, TM

floppy disks and billing and accounting for products distributed from GSFC and Lanham. EDC continued to work closely with GSFC to improve the automated cloud cover routines used at GSFC and to optimize handling customer complaint problem data alerts (PDA's) between EDC and GSFC. PDA's generated during this quarter were: #'s 44, 45, 46, 47, and 48 for TM film inconsistent wavy registration tick marks caused by an LBR 2 jitter problem at GSFC; #49 for dirty TM film; and #50 for TM data vertical striping/noise and horizontal shift problems.

Effort continued to increase the volume of and improve the timeliness of TM data products available to users. Testing continued to better understand and determine optimum band combinations for color products using TM bands 5 and 7.

6. NOAA Administrative Support

Office space was provided for the two NOAA and two EOSAT representatives located in the Customer Services area at EDC. EDC responded to requests from NOAA and EOSAT regarding past, current, and projected Landsat data sales and for software and hardware impacts for changes to certain Landsat data handling and processing systems and procedures, etc.

7. Problems

- a. Both LBR's experienced periodic density, scale, and non-uniformity problems which had minimal impact on MSS data processing. LBR 2 was down for the last half of September because of density banding and scale problems. A new modulator was installed in LBR 2.
- b. During October, a corrupted LBR look-up table caused the rejection and subsequent reprocessing of 296 MSS scenes at EDC.

EROS Data Center

Landsat Processing, Production and Data Distribution Summary
First Quarter FY 1988Data Processing Performance

	<u>MSS</u>	<u>TM</u>
Scenes received at EDC	7,227	1,188
Scenes Processed to MIF	8,009	1,003
Average Days-Rec'd. to MIF	3	3
Quality of Scenes to MIF		
Good (8)	93%	0%
Fair (5)	4%	88%
Poor (2)	3%	10%
End-of-quarter Scene Backlog	58	0

Standard Data Production Performance

<u>Product Type</u>	<u>Frames Produced</u>	<u>Average Days- Order to Product Ship</u>
B/W Film	1,067	8
B/W Paper Contact	492	9
B/W Paper Enlargement	250	6
FCC Generation	414	11
Color Paper Contact	20	4
Color Paper Enlargement	289	6
Color Film	443	7
Digital Products	2,221	2

Special Agency Data Production Performance

MSS Scenes Processed and Shipped	126
Average Days-Data Rec'd. to Product Ship	7

LANDSAT SALES SUMMARYFirst Quarter FY 1988

<u>Products/Services/Charges</u>	<u>Current Quarter</u>		<u>Last Quarter</u>	
	<u>Items</u>	<u>Dollars</u>	<u>Items</u>	<u>Dollars</u>
1. Imagery Products	2,984	\$ 452,450	3,809	\$ 559,640
a. MSS/RBV	(1,761)	(210,980)	(2,968)	(363,390)
b. TM TIPS	(1,223)	(241,470)	(840)	(196,150)
c. TM Scrounge	0	0	(1)	(100)
2. Digital Products	2,221	\$1,645,130	2,325	\$1,447,275
a. MSS/RBV Scenes	(685)	(424,380)	(1,398)	(853,440)
b. Add'l MSS Copies	(2)	(120)	0	0
c. MSS Sample CCT's	0	0	(2)	(100)
d. TM TIPS Quads	(1,411)	(1,214,220)	(694)	(614,415)
e. Add'l TM TIPS Copies	(56)	(3,840)	(44)	(2,640)
f. TM Scrounge Scenes	0	0	0	0
g. TM Sample CCT's	0	0	(3)	(600)
h. Floppy Disks	(67)	(2,570)	(184)	(6,080)
3. Miscellaneous	42	\$ 110,077	25	\$ 115,620
4. Accession Aids		\$ 6,499		\$ 850
5. Postage Charges (Non-US)		\$ 8,759		\$ 10,859
6. Sales Tax		\$ 14,208		\$ 13,516
7. Subtotal (#1-#6)	5,247	\$2,237,123	6,159	\$2,177,760
8. Acquisition Charges and Cloud-Cover Surcharges	982	\$ 48,400	2,699	\$ 193,600
9. TOTAL LANDSAT SHPD. SALES	6,229	\$2,285,523	8,858	\$2,371,360
10. Sales Returns/Allowances		\$ 76,416		\$ 72,721
11. Reimbursable Work-In- Process		\$ 148,735		\$ 332,989
12. Average Order Turnaround Time for Std. Photo. and Digital Products		6 days		8 days

LANDSAT CUSTOMER PROFILE PERCENTAGES

First Quarter FY 1988

<u>CATEGORY</u>	<u>IMAGERY</u>		<u>DIGITAL DATA</u>	
	<u>Items</u>	<u>Dollars</u>	<u>Items</u>	<u>Dollars</u>
Federal Government	44%	43%	65%	62%
USGS	(2%)	(2%)	(7%)	(6%)
Other Federal	(42%)	(41%)	(58%)	(56%)
State/Local Government	0%	0%	0%	0%
Academic	4%	2%	4%	4%
Industrial	20%	22%	17%	19%
Individual	2%	3%	1%	1%
Non-U.S.	<u>30%</u>	<u>30%</u>	<u>13%</u>	<u>14%</u>
	100%	100%	100%	100%