January 14, 1973

Type I Progress Report: Period November 14, 1972 - January 14, 1973

Geologic Analysis and Evaluation of ERTS-A Imagery for the State of New Mexico

MMC-262

Principal Investigator: Dr. Frank E. Kottlowski
GSFC ID No. S349
NASA Contract No. NAS5-21861

Although ERTS-1 has been in orbit for nearly six months, we have not been able to conduct what we feel to be any significant geologic research. The main problems we have encountered involve data acquisition and quality. As our investigation involves the identification and study of geologic features, we originally thought that the 9 x 9 black and white prints and color composites would be the most useful data formats. We have received 160 70mm black and white negatives and only 55 9 x 9 black and white prints, however, 34 of the negatives and 16 of the prints are duplicates. The 39 original prints we have received represent only ten time-frames of ERTS data and they cover only about 25 percent of the state. Unfortunately, the quality of all of the prints we have received is extremely bad, for the most part they are considerably overexposed. Only three of the prints we received have been of any use to us.

We have corresponded with NDPF User Services regarding the quality of our ERTS imagery (see attached letter to Mrs. Blanken). Mr. Peavey of NDPF answered our inquiry and suggested that we attempt to generate our own prints from the 70mm negatives or attempt to work directly from 9 x 9 positive transparencies. We currently are experimenting with the 70mm negatives and we have ordered some positive transparencies.

We have little in the way of scientific accomplishments to report. We have not identified any previously unrecognized geologic features and we have had difficulty in identifying many known features from our ERTS data. Perhaps the only result we can report is that ERTS-1 imagery appears to be far inferior to more conventional imagery (Apollo, Gemini and conventional aerial photographs) for the purposes of geologic investigations.

We have not published any articles resulting from our work with ERTS-1, however an ERTS color composit was featured on the cover of the Bureau's Annual Report.

Regarding the problem of image quality, we suggest that if the power supply to the MSS and RBV sensors on ERTS-1 can be varied to produce pictures with more ground surface contrast, such steps be taken.

We submitted a change in our standing order on January 9, 1973. A copy of the changed standard order form is attached to this report. No Image Descriptor Forms were submitted to NASA during this report period. Five Date Request Forms for retrospective data were submitted to GSFC/NDPF during this period. The dates of these requests are as follows:

1. November 29, 1972 (two forms)
2. December 7, 1972
3. December 13, 1972 (two forms)

We are currently attempting to devise an economical method of upgrading ERTS data so that we can begin the scientific phase of our investigation. The Bureau staff also is working on other geologic projects unrelated to ERTS.

Karl Vonder Linden

Karl Vonder Linden

November 30, 1972

NDPF User Services, Code 563
Building 23, Room E 413
NASA Goddard Space Flight Center
Greenbelt, Maryland 20771

Dear Mrs. Blanken:

Our ERTS-1 investigation, GSFC ID S-349, is concerned with the identification of geologic features from ERTS-1 imagery. So far we have received 38 bulk-processed black and white prints of parts of our study area. These prints represent the output of all four MSS bands in all but two of the separate frames. Unfortunately, all but three of the photos we received are too light to be of much use in our investigation. Large areas of almost of the photos appear to have been severely overexposed; hence the contrast over much of the photos' surfaces is insufficient to allow the identification of features in these lighter areas.

Because of the qualitative rather than quantitative nature of our investigation, constant reflectance values of individual MSS bands between individual frames are not critical. What is important is to obtain the maximum contrast possible over all parts of each frame. I have included two adjacent prints to illustrate this point. Image 1030-17262 is far too light to be of much use to us. Image 1030-17265 however, is the most satisfactory print we have received as far as overall contrast is concerned. If the lighter ~~areas~~ scenes, such as 1030-17262 could be darkened when printed, I feel much of our problem would be eliminated. As stated before, it is not critical if the overlap area in one frame is darker than the same area in the adjacent frame.

Would it be possible to control or monitor future orders for prints for our investigation so that contrast is maximized? If all our prints were similar to 1030-17265, we would be in excellent shape. If you wish to retain 1030-17265 to use as a standard please do so. Please let us know if you encounter any problems with respect to generating higher-contrast prints. Thank you very much.

Sincerely yours,

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Karl Vonder Linden
Mining Engineer & Environmental Geologist

KVL/sw
cc: G. R. Stonesifer
Technical Monitor

ERTS 1 STANDING ORDER FORM

(See Instructions on Back)

DATE Jan. 9, 1973

GSFC ID NUMBER S 349

PRINCIPAL INVESTIGATOR Frank E. Kottlowski

TELEPHONE NO. (505) 835-5302 ☐ NEW

SHIP TO: Karl Vonder Linden

(NAME)

New Mexico State Bureau of Mines

(AGENCY)

and Mineral Resources

(STREET)

Socorro (CITY) New Mexico (STATE) 87801 (ZIP)

☐ ADDITION

☒ CHANGE

☐ DELETION

CATALOGS DESIRED

STANDARD ☒ U.S. ☐ NON-U.S.

DCS ☐

MICROFILM ☐ U.S. ☐ NON-U.S.

☐ CHECK IF ADDRESS IS NEW

NDPF USE ONLY

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AREA NUMBER	GEOGRAPHIC POINTS		CLOUD COVER %	QUALITY	COVERAGE PERIOD		PROD		TICK MARK	QUANTITY	RBV BANDS			MSS BANDS				DELETE
	LATITUDE	LONGITUDE			START DATE	STOP DATE	TYPE	FORMAT			1	2	3	1	2	3	4	
FROM:	37°00'N	109°-05'W	1		080172	083172		M		1	X	X	X	X	X	X	X	
	37°00'N	103°-00'W			110172	113072		P		1	X	X	X	X	X	X	X	
	31°00'N	103°-00W			010173	013173												
	31°00'N	109°-05'W			050173	053073												
					080173	083173												
					110173	113073												
					010174	013173												
TO:	37°00'N	109°-05'W	2	G	080172	083172		M		1	X	X	X	X	X	X	X	
	37°00'N	103°-00'W			110172	113072		T		1	X	X	X	X	X	X	X	
	31°00'N	103°-00'W			010173	123173												
	31°00'N	109°-05'W																

GSFC 37-3 (7/72)

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INVESTIGATOR'S COPY