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FOURTH BI-MONTHLY PROGRESS REPORT
UNIVERSITY OF ALASKA
ERTS PROJECT 110-12
March 31, 1973

A. TITLE OF INVESTIGATION:

Evaluation of feasibility of mapping seismically active faults in Alaska.

B. PRINCIPAL INVESTIGATION/GSFC ID:

Larry Gedney/GSFC ID:UN601

C. PROBLEMS IMPEDING INVESTIGATION:

None.

D. PROGRESS REPORT:

1. Accomplishments during reporting period:

During the past reporting period, a great deal of interaction and exchange of ideas has taken place between the principal investigators and others knowledgeable in the field of tectonics of Alaska. Foremost among these "talk sessions" was a delivery made by the principal investigator to a group composed of various members of the University staff, the U. S. Geological Survey, the State of Alaska Geological Survey, the State Highway Department, and various other groups with an interest in ERTS-1 imagery and its possible applications. The presentation was part of a two-day symposium on the tectonics of Alaska, conducted at the Geophysical Institute, and involving representatives of the various geological disciplines. Total attendance was in the neighborhood of 50. A further exchange of ideas with other ERTS-1 principal investigators occurred at the ERTS symposium in March, where a paper on the tectonic aspects of Alaska as seen in ERTS-1 imagery was presented.

While practically all of the imagery received of the test area has been inspected (at least cursorily), a great deal of detailed interpretation remains to be done. It seems that every time we look again at a "scene", or that whenever a person unfamiliar with the data looks at it, we discover something we hadn't noticed before. Much has been learned during the past reporting period by incorporating the viewpoints of others into those held by the principal investigators.

2. Plans for next reporting period:

We intend to devote much of our time during the next reporting period in attempting reconciliations between existing geologic maps and ERTS-1 imagery of the same areas. Such a reconciliation will be necessary before definitive interpretations of the manner in which Alaska is being tectonically deformed will be possible. We also

(E73-10405) EVALUATION OF FEASIBILITY OF
MAPPING SEISMICALLY ACTIVE FAULTS IN
ALASKA Bimonthly Progress Report (Alaska
Univ., Fairbanks.) 4 p HC \$3.00
N73-20367
Unclas
00405
CSCL 08B G3/13

intend to compare maps of seismicity with the ERTS-1 images in order to further define those lineations, visible on the ERTS data, which are surface expressions of seismically active faults, and those which are old, or dormant features. The next step will be to attempt an interpretation of the pattern of tectonic strain accumulation and release in the test area as a whole.

We will also be involved in preparing the figures and text for a presentation to be delivered to the meeting of the Seismological Society of America in Golden, Colorado, during May. This paper, in essence, will be a comparison of ERTS-1 imagery with zones of current seismicity.

E. SIGNIFICANT RESULTS:

See attached sheet.

F. PUBLICATIONS:

Some aspects of regional tectonics in Alaska as seen in ERTS-1 imagery, Paper G23, Symposium on significant results obtained from ERTS-1 (Abstracts), March, 1973.

Finding faults in Alaska on the basis of ERTS-1 imagery, Vol. 5, No. 1, The Northern Engineer (In press, copies will be supplied to NASA when they become available).

G. RECOMMENDATIONS:

None.

H. CHANGES IN STANDING ORDER FORMS:

None.

I. ERTS IMAGE DESCRIPTOR FORMS:

Attached.

J. DATA REQUEST FORMS:

None.

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PRINCIPAL INVESTIGATOR: Larry Gedney

TITLE OF INVESTIGATION: Evaluation of feasibility of mapping seismically active faults in Alaska.

DISCIPLINE: Mineral Resources, Geological Structure and Landform Surveys.

SUBDISCIPLINE: Earthquake Zones Investigations.

SUMMARY OF SIGNIFICANT RESULTS:

The Yukon-Tanana uplands north and east of Fairbanks appear, on ERTS-1 imagery, to be composed of a number of large-scale (on the order of 100 km square) crustal blocks. The boundaries of these blocks appear to be defined by a number of northeast-striking lineaments (approximately N60°E) which form the major river valleys of the area. Principal among these are the valleys of the Salcha River, the Chena River, and the Chatanika River. These lineaments are all seismically active, and are thus presumed to be faults. The largest earthquakes to occur on these lineaments in recent years (although very many smaller events have been recorded) have been: (1) for the Salcha lineament, a magnitude 7.3 earthquake in 1937, (2) for the Chena lineament, a magnitude 6.0 earthquake in 1967, and (3) for the Chatanika lineament, a magnitude 4.6 earthquake in 1969. This parallel set of lineaments appears to be intersected at various angles by a secondary set of faults trending generally north-south. The larger earthquakes in the area occur at the intersections of the two sets. It would therefore appear that the seismicity of this part of Alaska may be conceptually represented by the grinding together of (relatively) rigid blocks, with earthquakes occurring along their common boundaries, and at the intersections where three or more blocks come in contact (Image ID Nos. 1103-20502, 1029-20381, and 1029-20383).

ERTS IMAGE DESCRIPTOR FORM

(See Instructions on Back)

DATE March 31, 1973

PRINCIPAL INVESTIGATOR Larry Gedney

GSFC UN601

ORGANIZATION Geophysical Institute, University of Alaska

NDPF USE ONLY

D _____

N _____

ID _____

PRODUCT ID (INCLUDE BAND AND PRODUCT)	FREQUENTLY USED DESCRIPTORS*			DESCRIPTORS
	Fault	Mountain	Glacier	
110521024M	x	x	x	
110320493M		x		River
108120281M	x	x	x	River
108120284M	x	x	x	River

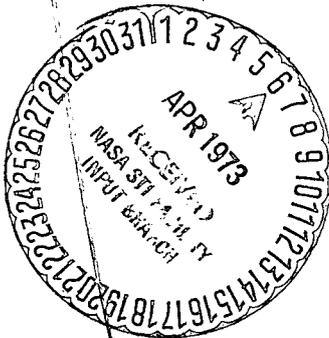
*FOR DESCRIPTORS WHICH WILL OCCUR FREQUENTLY, WRITE THE DESCRIPTOR TERMS IN THESE COLUMN HEADING SPACES NOW AND USE A CHECK (✓) MARK IN THE APPROPRIATE PRODUCT ID LINES. (FOR OTHER DESCRIPTORS, WRITE THE TERM UNDER THE DESCRIPTORS COLUMN).

MAIL TO ERTS USER SERVICES
 CODE 563
 BLDG 23 ROOM E413
 NASA GSFC
 GREENBELT, MD. 20771
 301-982-5406

INSTRUCTIONS FOR COMPLETION OF IMAGE DESCRIPTOR FORM GSFC 37-2 (7/72)

Image descriptors are only supplied by investigators. An image descriptor is a term which assists in defining the content of an image. All of these inputs will be compiled and entered into the NDPF data base for subsequent investigator query servicing and catalog preparation. A standard vocabulary of image descriptors is included in the Data Users Handbook, Section 4.

Coding for the major portion of this form is straight forward and self explanatory. It should be noted however that it is extremely important to assign the correct product ID to those descriptors that apply to a particular spectral image or a combination of spectral images. Below is a description of the product ID along with tables defining the valid band and product type (processing designator). Your cooperation in providing complete, valid product ID's would be greatly appreciated.



SATELLITE NUMBER (1 = ERTS A; 2 = ERTS B)

DAYS SINCE LAUNCH

HOUR OF DAY (GMT)

MINUTES OF HOUR (GMT)

TENS OF SECONDS OF MINUTES (GMT)

PRODUCT ID

A	D	D	D	H	H	M	M	S	B	P
1	0	3	7	0	5	1	8	5	X	B

"B" CODE SENSOR SPECTRAL BAND DESIGNATOR

B	Band
1	RBV 1
2	RBV 2
3	RBV 3
4	MSS 1
5	MSS 2
6	MSS 3
7	MSS 4
R	All RBV Bands
M	All MSS Bands
X	All Bands

"P" CODE PROCESSING DESIGNATOR (PRODUCT)

P	Processing Type
Blank	Sys. Corr.
A	Scene Corr.
B	Sys. Corr. Color
C	Scene Corr. Color
D	Sys. Corr. Digital
E	Scene Corr. Digital
X	Non Standard Processing

Sys. Corr. - System Corrected Images (Bulk)
Scene Corr. - Scene Corrected Images (Precision)