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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WASHINGTON, D.C. 20242

Technical Letter
NASA-47
October 1966

Dr. Peter C. Badgley
Chief, Natural Resources Program
Office of Space Science and Applications
Code SAR, NASA Headquarters
Washington, D. C. 20546

Dear Peter:

Transmitted herewith are 3 copies of:

TECHNICAL LETTER NASA-47
GEOLOGIC EVALUATION OF RADAR IMAGERY
OF THE
SPANISH PEAKS REGION, COLORADO*

by

Ross B. Johnson**

Sincerely yours,

William A. Fischer
Research Coordinator
Earth Orbiter Program

*Work performed under NASA Contract No. R-09-020-015
**U. S. Geological Survey, Denver, Colorado

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TECHNICAL LETTER NASA-47
GEOLOGIC EVALUATION OF RADAR IMAGERY
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Ross B. Johnson**

October 1966

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not be quoted without permission

Prepared by the Geological Survey
for the National Aeronautics and
Space Administration (NASA)

*Work performed under NASA Contract No. R-09-020-015

**U.S. Geological Survey, Denver, Colorado

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GEOLOGIC EVALUATION OF RADAR IMAGERY
OF THE
SPANISH PEAKS REGION, COLORADO

by

Ross B. Johnson

The area of the radar imagery strip (fig. 1 and fig. 2) extending from Alamosa to Aguilar, Colorado at the latitude of the Spanish Peaks ($37^{\circ}22'30''$ N. Lat.) has been mapped (fig. 3) in recent years by geologists of the Southern Rocky Mountains Branch (Johnson, R. B., 1961). Inspection of the radar image revealed conspicuous northwest-southeast striking lineaments (circled areas in fig. 2) in Tertiary sedimentary rocks of continental origin. These lineaments do not show on aerial photographs, and were not recognized on the ground during field mapping. The lineaments at first were believed to be faults of small displacement, narrow shear zones, tension joints, or easily eroded lamprophyre dikes; however, close inspection in the field subsequently did not reveal any geologic feature responsible for the lineaments on the radar strip.

Radar imagery, at least of the quality of this strip, does not seem to be adequate for geologic mapping. Flat-lying beds cannot be distinguished from vertical beds; Precambrian metamorphic and igneous rocks, Tertiary lava flows, Paleozoic sedimentary rocks, and semi-consolidated Tertiary gravels are not distinctive. Folds and faults, even of regional size, cannot be seen. However, the dikes associated with the Spanish Peaks are well displayed, and show their remarkable

pattern. The "Stonewall" formed by the vertical beds of the Dakota Sandstone shows up well owing to easily eroded shales above and below the sandstone. A known fault along the eastern front of the Sangre de Cristo Mountains, mapped on the ground, can be traced on the radar image for several miles.

Radar imagery may be more useful in geomorphic and physiographic investigations. Physiographic units such as the San Luis Valley, the Sangre de Cristo Mountains, the highly dissected Park Plateau, and the Great Plains are plainly seen over an area of about 1,000 square miles. Natural features, such as streams and pedimented surfaces, are easily seen; but cultural features, such as paved highways and towns, are seen only locally. The most conspicuous feature on the strip is Smith Reservoir, which is a small fluctuating storage reservoir for irrigation purposes in the San Luis Valley southwest of Fort Garland, Colorado.

· Reference

Johnson, R. B., 1961, Coal resources of the Trinidad coal field in Huerfano and Las Animas Counties, Colorado; U. S. Geological Survey Bulletin 1112-E, p. 128-180.



JOINS FIGURE 2

FIGURE 1.

(47)

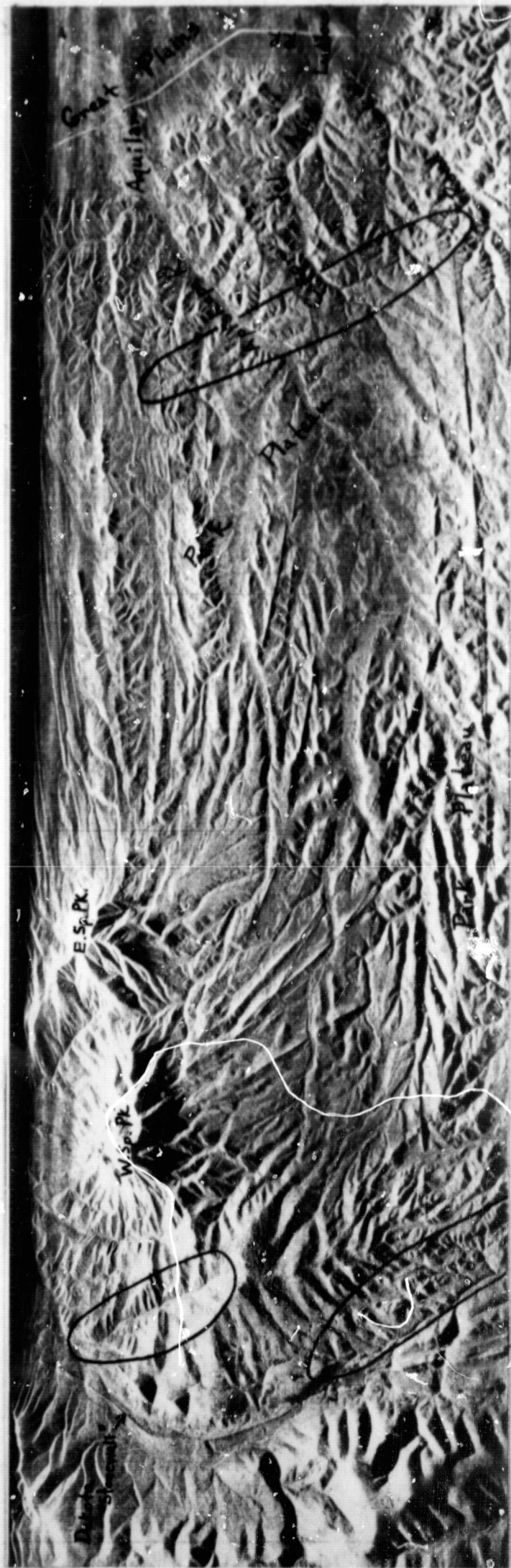


FIGURE 2.

(47)

