

Pecora file

IC 8-70



# United States Department of the Interior

GEOLOGICAL SURVEY  
RESTON, VA. 22092

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AUG 8 1983

(dated 8-8-83)

Mr. Allen H. Watkins  
Chief, EROS Data Center  
Sioux Falls, South Dakota 57198

Dear Al:

I accept with pleasure your invitation to present a paper at the Pecora Symposium in October. The final title of my paper is, "Lithologic Mapping Using Landsat Thematic Mapper Data," and an abstract is attached.

Thank you for thinking of me.

Sincerely,

John W. Salisbury  
Assistant Division Chief for  
Earth Resources Observation  
Systems (EROS) Office  
National Mapping Division

Attachment

Lithologic Mapping Using Landsat Thematic Mapper Data  
M.H. Podwysocki, J.W. Salisbury, O.D. Jones and D.L. Mimms  
U.S. Geological Survey, Reston, Va., 22092

The Landsat-4 Thematic Mapper (TM), with its new near-infrared bands centered at 1.65  $\mu\text{m}$  and 2.20  $\mu\text{m}$  and spatial resolution of 30m has been used to distinguish rocks containing minerals having ferric-iron absorption bands in the visible and near-infrared and Al-O- and CO<sub>3</sub> absorption bands in the 2.1- 2.4  $\mu\text{m}$  regions. On the basis of characteristic absorption bands, digitally processed TM data were used to differentiate vegetated from non-vegetated areas, limonitic from nonlimonitic rocks, rocks containing minerals having absorption bands in the near-infrared region from rocks lacking the infrared absorption bands. Specific minerals were detected in both the humid eastern and semiarid western United States. The absorption bands in the near-infrared region were used to detect kaolinite in open-pit exposures of a kaolin mining district near Macon, Georgia; calcium carbonate in the beach sands along the east coast of Florida; and kaolinite, alunite, jarosite, sericite and gypsum in natural exposures near Boulder City, Nevada.

These results show that the additional spectral bands in the near-infrared region and increased spatial resolution of the Thematic Mapper provide a valuable tool for distinguishing several significant geologic materials not distinguishable from space using previous imaging systems. They also show that TM data can be successfully used in a variety of geologic environments.