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TYPE I REPORT

TITLE: STRUCTURAL AND LITHOLOGIC STUDY OF NORTHERN CALIFORNIA  
COAST RANGES AND SACRAMENTO VALLEY, CALIFORNIA

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The first ERTS-1 data was received by the Principal Investigator on October 23, 1972.

Preliminary analysis of the data received has disclosed two potentially important northwest-trending systems of linear features within the Northern California Coast Ranges and a third system, which trends northeast, can be traced with great uncertainty across the alluviated part of the Sacramento Valley and into the foothills of the Sierra Nevada. These linear features may represent fault systems or zones of shearing because topographic offset and stratigraphic disruption can be seen along one or two of the lineations. One of the systems of linear features is parallel or subparallel with the San Andreas fault and is confined to the Coastal belt (here referred to as the Coastal System). Another set, which acutely joins but does not appear to transect the Coastal System, is confined to the central part of the Coast Ranges. This system, subsequently referred to as the Central System, is less well defined but appears to be the chief influence on the structural and topographic grain of the terrain. The third set of linear features, the Valley System, trends northeasterly, about normal to the Central system. Stratigraphic offset and/or disruption of the Late Mesozoic sedimentary rocks along the western margin of the Sacramento Valley and in the western foothills of the Sierra Nevada can be seen on the imagery. Northeasterly trending linear elements, subparallel with the Valley System, can be detected within the alluviated part of the Sacramento Valley. These elements may reflect the continuation of the Valley System within the bedrock that floors the Sacramento Valley. The Valley System has not been recognized heretofore. Because of the limited imagery coverage received so far, the extent of these linear features or their tectonic significance cannot be ascertained.

One, and perhaps two, stratigraphic unconformities within the Late Mesozoic sedimentary rocks were detected during preliminary examination of the imagery; however, more careful analysis of subsequent imagery and field examination is required to verify this preliminary interpretation.

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Analysis of U-2 imagery supplied by NASA Ames Research Center has been completed and photogeologic criteria for the various rock types has been established for the different spectral bands of ERTS. Because of the seasonal difference between the U-2 imagery and the ERTS-1 imagery presently at hand, no direct correlation of photogeologic criteria is possible. However, subtle tonal and topographic differences within areas familiar to the Principal Investigator, suggest that gross rock type differences may be detected on ERTS-1 imagery.