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TITLE: Structural and Lithologic Study of Northern Coast
Ranges and Sacramento Valley, California

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Accomplishments:

The first working map of the system of linear features has continued during the reporting period and is now nearly completed. The work progress was delayed somewhat by the preparation of publishable abstracts, reports, and maps for the ERTS-1 Symposium, March 5-9; however, it is anticipated that the work will progress as in the Data Analysis Plan submitted in January, 1973 (Copy attached). Preliminary photogeologic evaluation of the various lithologic types in the project area has been started, but the full evaluation will not be possible until imagery taken during the seasonal change (from the winter wet season to the summer dry season) have been received.

Significant Results:

The significant results on the project were reported at the ERTS-1 Symposium and a copy of the abstract for the talk is attached.

Data Request Forms Submitted (Retrospective data):

Date submitted: Dec. 4, 1972 - Color Composites

Date received: Mar. 11, 1973

Data Analysis Plan: See attached

RELATION OF ERTS-1 DETECTED GEOLOGIC STRUCTURE TO ORE AND
MINERAL FUEL DEPOSITS, NORTHERN COAST RANGES, CALIFORNIA

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Analysis of ERTS-1 imagery of the Northern California Coast Ranges has disclosed a potential relation between a heretofore unrecognized fracture system and known deposits of mercury and geothermally active areas in the Coast Range and between oil and gas fields in the Sacramento Valley.

Three potentially important systems of linear elements within the Coast Ranges, detected on ERTS imagery, 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 is subparallel to the San Andreas fault and is confined to the Pacific Coastal Belt (Coastal System). Another set (Central System), which acutely joins but does not transect the Coastal System, is confined to the central core of the Coast Ranges. The Central System is less well defined, but it appears to be the chief control for the structural and topographic grain of the terrain. The third set of linear features (Valley System) has not heretofore been recognized. It trends northeasterly, about normal to the Central System and can be traced from the Coast Ranges across the alluviated part of the Sacramento Valley into the foothills of the Sierra Nevada. Stratigraphic offset and disruption of the Late Mesozoic sedimentary rocks along the western margin of the Sacramento Valley are associated with the Valley System. Linear elements, subparallel to the Valley System, can be detected in the alluviated part of the Sacramento Valley and they may reflect the continuation of the Valley System within the bedrock that floors the Sacramento Valley.

Some of the known mercury deposits and geothermally active areas near Clear Lake, in the Coast Ranges, are along the Valley System or at the intersection of the Central and Valley Systems. The plotted locations of some of the oil and gas fields in the Sacramento Valley are associated with the Valley and/or Central Systems. If these relations prove reliable, the ERTS imagery may prove to be an extremely useful exploration tool.

DATA ANALYSIS PLAN:

- a) Planned Schedule - The following is a tentative schedule of work on the project for the remainder of the investigation. The investigation has been divided into several tasks, some of which may proceed concurrently. These tasks are:

Task I - Delineate linear features detectable on ERTS-1 imagery and transfer onto a standard base map at a scale of 1:1,000,000 or 1:500,000

Task II - Determine photogeologic characteristics on ERTS imagery of known rock types in the various microclimates and monitor changes in characteristics with changes in season.

Task III - Delineate stratigraphic data on base maps prepared in Task I and plot known mercury deposits and other known ore deposits, and thermal steam areas on base map.

Task IV - Field check selected areas to verify or modify interpretations made from ERTS imagery.

Task V - Correlate geologic and climatic data obtained from ERTS and from underflights with published data to verify accuracy and reliability of interpretation.

Task VI - Preparation of final report.

These tasks are tentatively scheduled as follows:

<u>Dates</u>	<u>Tasks to be performed</u>
Dec. 1972 through Mar. 73	Tasks I, II
Mar. 1973 through June 73	Tasks II, III
June 1973 through Sept. 73	Tasks II, III, IV
Sept. 1973 through Dec. 73	Tasks V, VI

- b) Changes in ERTS data requirements: Because of nature of investigation, bulk color composite paper prints in 9 x 5 inch format are requested on a standing order basis.
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