

INTRODUCTION
The Utuado quadrangle was mapped as part of a program of geologic mapping and mineral resource investigations by the U.S. Geological Survey in cooperation with the Economic Development Administration of Puerto Rico.

STRATIFIED ROCKS
Consolidated rocks, ranging from Cretaceous to middle Tertiary in age, are exposed in the Utuado quadrangle.

INTRUSIVE ROCKS
In the southern part of the quadrangle, a large body of intrusive rock, consisting mostly of granodiorite, forms part of the Utuado pluton.

FAULTS
Deformation by fracturing has had a pronounced effect on the Cretaceous and lower Tertiary rocks, and most of the rock units are faulted and jointed.

JOINTS
Joints are widely dispersed in all the pre-Oligocene rocks exposed in the Utuado quadrangle.

ECONOMIC GEOLOGY
Limestone, sand, and gravel are the principal mineral resources in the Utuado quadrangle.

MINOR BODIES OF GRANODIORITE AND DIORITE
Numerous small irregular dioritic bodies and dikes have intruded the Cretaceous rocks and the Utuado pluton.

VEINS, DIKES, AND SILL
Numerous, small, discontinuous tabular andesite (?) and aplite dikes and veins too small to map cut the older rocks of the quadrangle.

MASSIVE, FINE-GRAINED BLuish-GRAY ANDESITE
Massive, fine-grained bluish-gray andesite, is sporadically exposed along Highway 10 between coordinates 124,500-52,700 and 125,740-52,700.

HYDROTHERMAL ALTERATION
Intense hydrothermal alteration, while not common, is present in several places in the Utuado quadrangle, especially along the Caniaco fault.

STRUCTURAL GEOLOGY
Most of the Utuado quadrangle is located on the north flank of the principal fold of the Puerto Rico anticlinorium.

FOLDS
With the exception of the Jobs Formation, described below, all formations present in the Utuado quadrangle have been previously discussed (Nelson and Monroe, 1966, and Pease and Briggs, 1960).

JOBS FORMATION
Jobs Formation.—A thick sequence of massively bedded volcanic breccia and associated rocks is here named the Jobs Formation from the Quebrada Jobsa west of Lago Dos Bocas.

YUNES FORMATION
Yunes Formation.—A thick sequence of massive bedded volcanic breccia and associated rocks is here named the Yunes Formation from the Quebrada Yunes west of Lago Dos Bocas.

ALMONO FORMATION
Almono Formation.—A thick sequence of massive bedded volcanic breccia and associated rocks is here named the Almono Formation from the Quebrada Almono west of Lago Dos Bocas.

LAGOS FORMATION
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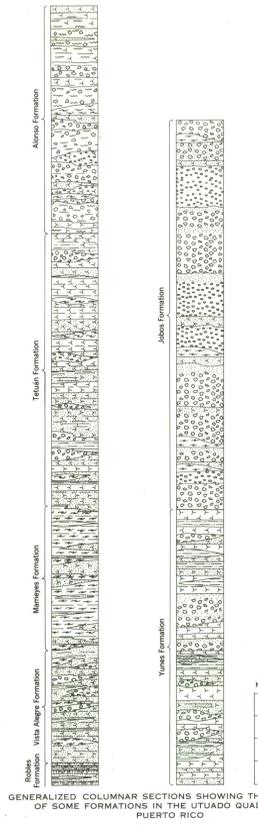
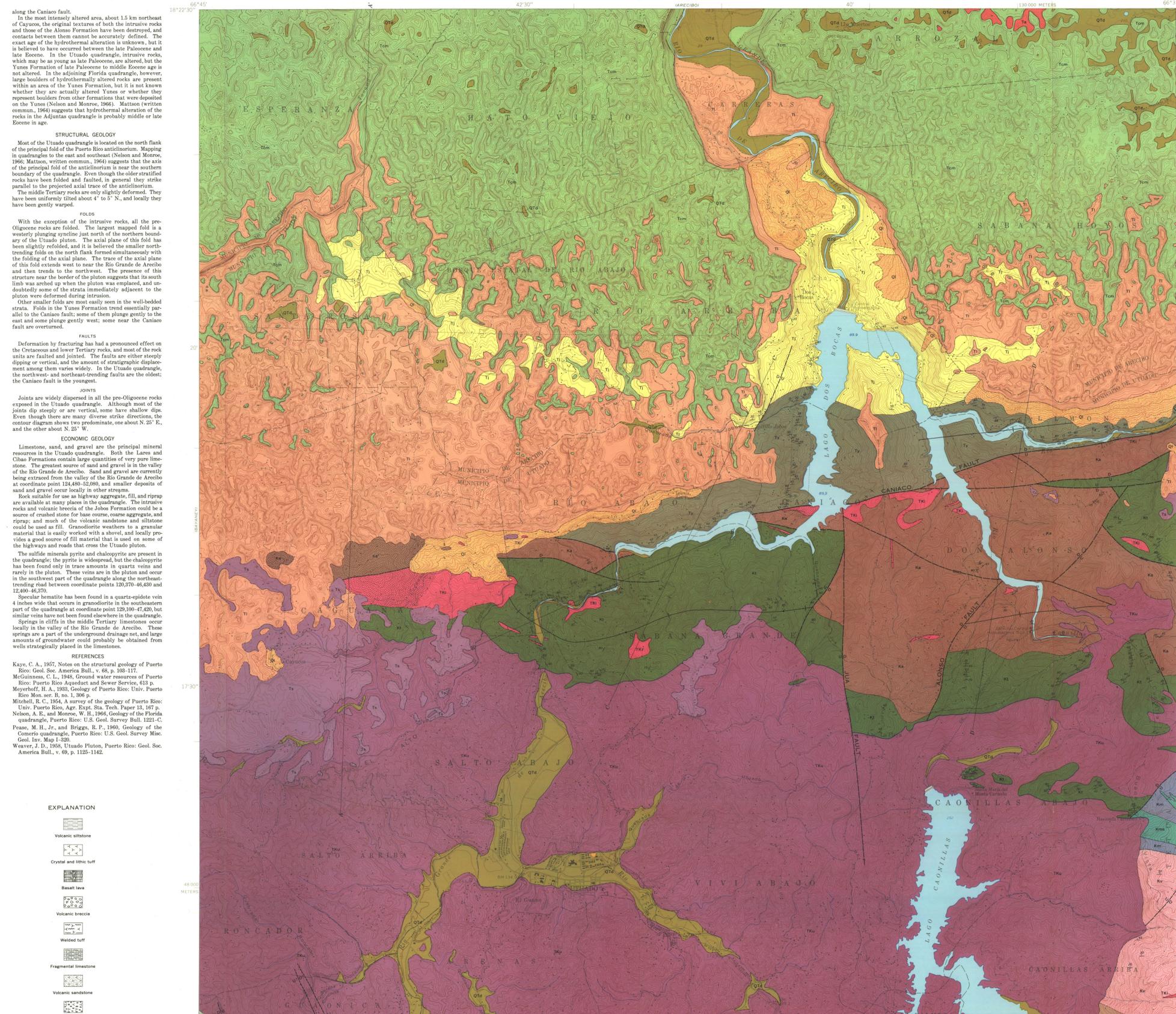
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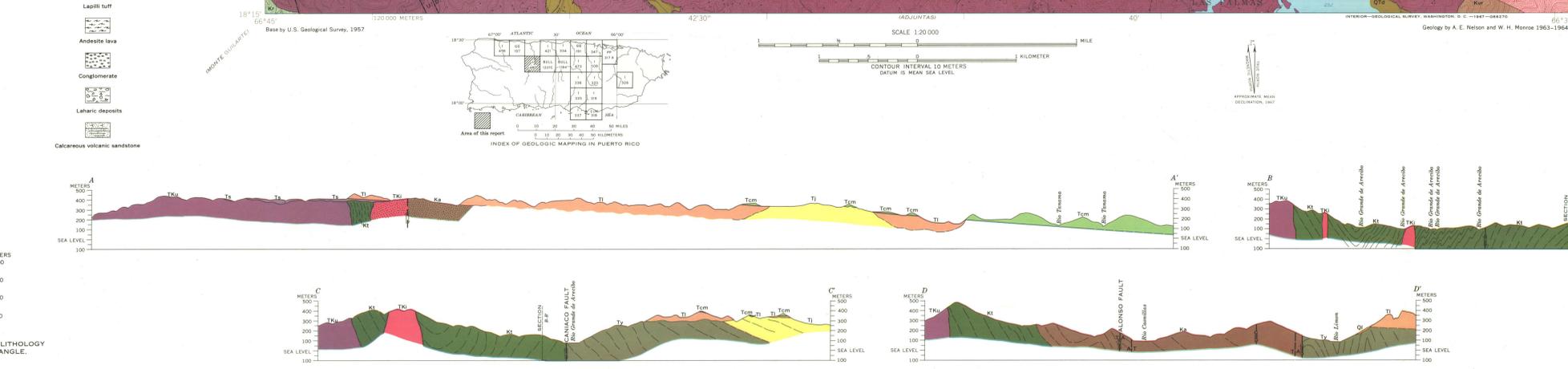
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GENERALIZED COLUMNAR SECTIONS SHOWING THE LITHOLOGY OF SOME FORMATIONS IN THE UTUADO QUADRANGLE, PUERTO RICO



CONTOUR DIAGRAM OF 500 JOINTS OCCURRING IN THE CRETACEOUS AND LOWER TERTIARY ROCKS IN THE UTUADO QUADRANGLE, PUERTO RICO