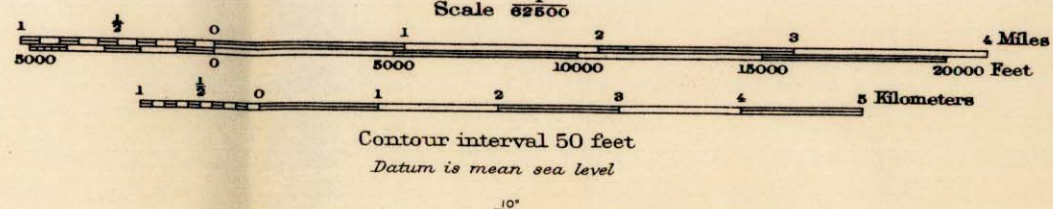
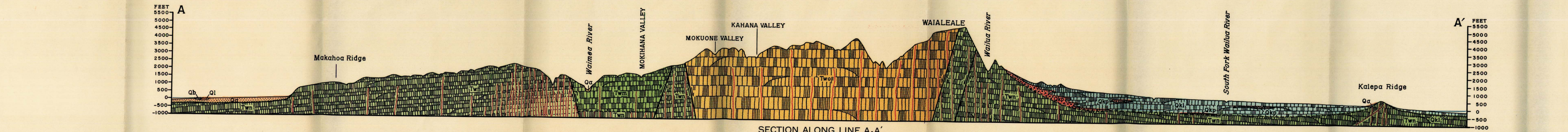


DIVISION OF HYDROGRAPHY STATE OF HAWAII GEOLOGIC AND TOPOGRAPHIC MAP OF THE ISLAND OF KAUAI HAWAII SHOWING WELLS, SPRINGS, TUNNELS, SHAFTS, AND STRUCTURE SECTION GEOLOGY BY GORDON A. MACDONALD, HAROLD T. STEARNS, D. C. COX AND D. A. DAVIS PREPARED IN COOPERATION WITH THE GEOLOGICAL SURVEY UNITED STATES DEPARTMENT OF THE INTERIOR



1960

Base from U. S. Geological Survey map surveyed in 1910 in cooperation with the territory of Hawaii.



EXPLANATION

SEDIMENTARY ROCKS

Legend for sedimentary rocks: CALCREOUS SEDIMENTS (Modern beaches (Qb) composed largely of unconsolidated calcareous fragments of marine organisms. Dunes of unconsolidated calcareous sand (Qd) blown inland from modern beaches.), YOUNGER NONCALCREOUS SEDIMENTS (Unconsolidated alluvium (Qa) along stream valleys and coastal plains, graded approximately to present base level.), CONSOLIDATED CALCREOUS DUNES (Calcareous sand blown inland into dunes (Qda) during former lower stands of the sea.), OLDER NONCALCREOUS SEDIMENTS (Poorly to moderately well consolidated alluvium (Qoa) graded to former base levels and now undergoing dissection; in part correlative in age with Koloa volcanic series. Poorly consolidated earthy sediments and marly lagoon deposits (Qo) on the Mana plain.)

KOLOA VOLCANIC SERIES

Legend for Koloa volcanic series: Lava flows (Qk) of nepheline basalt, meltilite-nepheline basalt, olivine basalt, picro-basalt, and basaltic andesite erupted from a large number of vents (Qkv) scattered over the eastern portion of the island. One flow of picrobasalt (Qkb) lies at the north shore. Thin beds of ash and tuffaceous soil (Qka) are intercalated with the flows. Masses of breccia and beds of conglomerate of the Palikea formation (Qkp) lie at the contact with the Waimea Canyon volcanic series and are intercalated between lavas of the Koloa volcanic series. The Koloa lava and the sedimentary rocks of the Palikea formation are intruded by dikes, and small bosses of oligoclase gabbro (Qkm) intrude the lavas.

MAJOR EROSIONAL UNCONFORMITY

Diagram illustrating a major erosional unconformity between the Tertiary and Quaternary periods, showing the relationship between the Waimea Canyon volcanic series and the Koloa volcanic series.

WAIMEA CANYON VOLCANIC SERIES

The Waimea Canyon volcanic series consists of four formations. The Napali formation (Tnw) consists of thin flows of olivine basalt, basalt, and picro-basalt accumulated on the flanks of the big shield volcano. Pit craters in the lavas of the Napali formation are filled with massive lava flows (Tnwv). The Ololohe formation (Tno) consists of thick flows of olivine basalt, basalt, picro-basalt, and rare andesite, accumulated in a broad caldera at the summit of the shield. Cinder cones (Tnoc) occur at vents, and bands of breccia (Tnob) occur along the margins of the caldera. The Haupu formation (Th) consists of thick flows of olivine basalt and picro-basalt accumulated in a small caldera on the southeast flank of the shield. The Masses of breccia (Tbh) occur along the margin of the Haupu caldera. The Makaweli formation (Tmw) consists of thick flows of olivine basalt, basalt, picro-basalt, and rare andesite accumulated in a graben on the southwest side of the shield, and equivalent in age to part of the Ololohe formation. Cinder cones (Tmwic) mark vents of the Makaweli lavas. A few beds of ash or tuffaceous soil are indicated (Tmwa). The breccia and conglomerate of the Mokuone member (Tmwom) of the Makaweli formation comprise masses of talus accumulated along the boundary fault scarp of the graben and stream-belt sedimentary strata intercalated with lavas of the Makaweli formation. All formations of the Waimea Canyon volcanic series are intruded by dikes. The dikes mapped in the field are shown by solid lines; those mapped from air photographs by dashed lines.

Legend for structural features: Fault, showing dip and downthrown side; Definitely located; Approximately located; Contact, definitely located; Contact, approximately located; Dip and strike of beds; Horizontal beds; Drilled well; Test hole; Shaft; High-level water development tunnel; Dug well; Spring; Quarry.

WATER-BEARING PROPERTIES

The sedimentary rocks are in general poorly permeable, but yield small amounts of basal water to wells at sea level. Water in the lagoon sediments (Ql) on the Mana plain is brackish. The rocks of the Koloa volcanic series are poorly to moderately permeable. They carry fresh or brackish water at sea level but generally yield it slowly. Locally they contain small bodies of water perched by ash or tuffaceous soil beds (Qka) or breccia or conglomerate of the Palikea formation (Qkp). The Napali formation (Tnw) of the Waimea Canyon volcanic series is mostly highly permeable, carries fresh water at sea level over much of the island, and yields it freely to wells. Locally it may contain water confined at high levels between dikes. The Ololohe (Tno), Haupu (Th), and Makaweli (Tmw) formations of the Waimea Canyon volcanic series are moderately to poorly permeable. They probably carry fresh or brackish water at sea level, but for the most part will not yield readily to wells. The breccia and conglomerate of the Mokuone member (Tmwom) of the Makaweli formation are poorly permeable and carry no water.

Legend for symbols: Village, Rock and buildings, River or secondary roads, Trail, Railroad, Bridge, Dam, District line, Forest reserve line, Abandoned or track-remnant line, Transportation symbols, Boundary monument, Bench mark, Permanent and temporary, Ditches, Apparatus tunnels and siphons, Church or school, Lighthouse, Stream, Intermittent stream, Contour, Contour, Depressions, Sand and sand dunes, Fresh marsh, Figures showing depth of water, and other hydrographic symbols.

RECENT, PLEISTOCENE, LATE TERTIARY, QUATERNARY, TERTIARY