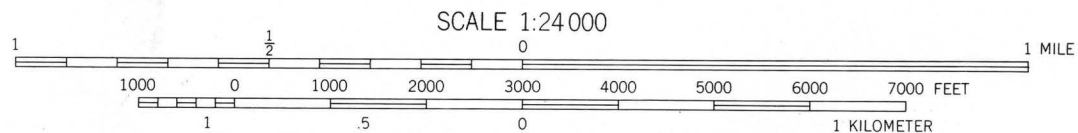


Base from U.S. Geological Survey, 1:24,000, Kilauea Crater, Volcano, Mokuapuhi Crater, Kau Desert, 1963



DISCUSSION

This structural map is intended to serve as a base for current and future scientific investigations of the summit area of Kilauea and as a complement to earlier geologic maps (Peterson, 1967; Walker, 1969) and studies on the summit caldera (Macdonald, 1965), the upper parts of both rift zones (Moore and Krivoy, 1964; Stearns and Clark, 1930) and the Koa fault system (Duffield, 1975).

This map also identifies areas of ground fractures that are potentially hazardous to visitors, and areas of potential landslides and fault offsets that are closely related to the fracture systems.

COMPILATION METHOD AND ACCURACY OF THE MAP

The map shows the faults, sets of fissures, eruptive vent lines and collapse features in the summit area of the volcano. It covers most of the Geological Survey's Kilauea Crater 7 1/2-minute quadrangle, together with parts of Volcano, Mokuapuhi Crater, and Kau Desert 7 1/2-minute quadrangles.

The compilation was made from ground observations and preliminary mapping during the year 1975, and from aerial photographs taken in 1964-65 and 1974-75 (see table). The map area was thoroughly traversed on foot and field checked in the summer of 1979 after the compilation. The aerial photographs offer a sharpness superior to 0.1 m, which makes possible, considering the average scale of pictures at 1:20,000, the identification of features 2 to 3 m in size. On the northern side of the caldera and the upper east rift zone, however, dense vegetation makes the location of all lineaments uncertain where field identification is not possible. In faults and cracks can be recognized vertical and horizontal offsets of the best conditions of observation, vertical and horizontal offsets of

A planimetric plotter was used to transfer the tectonic features from the photographs to the topographic base. Although the base map was printed in 1963, there have been no major changes in the surface topography of the area except for the depth of pit craters that have been filled by recent lava flows. The number of control points allowed position location to within an accuracy of 10 m. Allowing for errors of 0.5 m in drawing with the plotter, it is estimated that features are located to within an accuracy of 20 m.

ACKNOWLEDGEMENTS

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REFERENCES

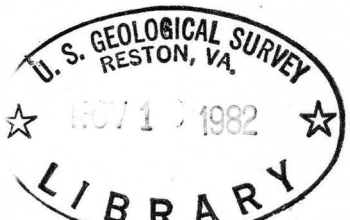
- Duffield, W. A., 1975, Structure and origin of the Koa fault system, Kilauea Volcano, Hawaii: U.S. Geological Survey Professional Paper 856, 12 p.
- Macdonald, G. A., 1965, Hawaiian calderas: Pacific Science, v. 19, p. 320-334.
- Moore, J. G. and Krivoy, H. L., 1964, The 1963 flank eruption of Kilauea Volcano and structure of the east rift zone: Journal of Geophysical Research, v. 69, p. 2033-2045.
- Peterson, D. W., 1967, Geologic map of the Kilauea Crater quadrangle, Hawaii: U.S. Geological Survey Geologic Quadrangle Map GQ-667, scale 1:24,000.
- Stearns, H. T. and Clark, W. O., 1930, Geology and water resources of the Kau district, Hawaii: U.S. Geological Survey Water-Supply Paper 616, p. 29-191.
- Walker, G. V., 1969, Geologic map of the Kau Desert quadrangle, Hawaii: U.S. Geological Survey Geologic Quadrangle Map GQ-827, scale 1:24,000.

PHOTOGRAPHS USED IN COMPILATION

Date	Flight	Frame	Approximate	Flight line location and direction
Film	Line No.	No.	scale	
EKL series, by U.S. Dept. of Agriculture:				
29/XII/64	50C	7-8	1:27,100	S to N, west Koa and upper southwest rift
1/II/65	100C	103-107	1:25,500	S to N, west caldera, from Koa to Bird Park
3/II/65	110C	139-143	1:24,900	S to N, south caldera to lower Moku Loa
6/II/65	120C	184-191	1:25,600	N to S, from Volcano to Poliokeawe Pali
2/II/65	140C	74-75	1:24,900	N to S, south caldera to Poliokeawe Pali
TOWILL series, by Robert M. Towill Corporation, Honolulu:				
28/VI/74	6356	1-5	1:19,300	NW to SE, from Bird Park to Pauahi Crater
2/II/75	6356	5-8	1:22,600	N to S, from caldera to Kalanaka'iki Pali

SYMBOLS

- MAJOR FAULT — Showing amount of dip; dashed where approximately located or covered. Ball and bar on downthrown side
- ERUPTIVE FISSURE — Showing date of opening. Ph, prehistoric (older than 1750 A.D.)
- WIDE OPEN CRACK
- CRACK — Approximately located
- TECTONIC FISSURE
- LINEAMENT
- STRIKE AND DIP OF BEDDING
- VERTICAL OR DILATIONAL OFFSET — In meters



STRUCTURAL MAP OF THE SUMMIT AREA OF KILAUEA VOLCANO, HAWAII

By
Patrice de Saint Ours

1982

M(200)
MF
no. 1368
c. 1