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U.S. Department of the Interior
U.S. Geological Survey

Scientific Investigations Map 2932–A
Sheet 1 of 2
Pamphlet accompanies map

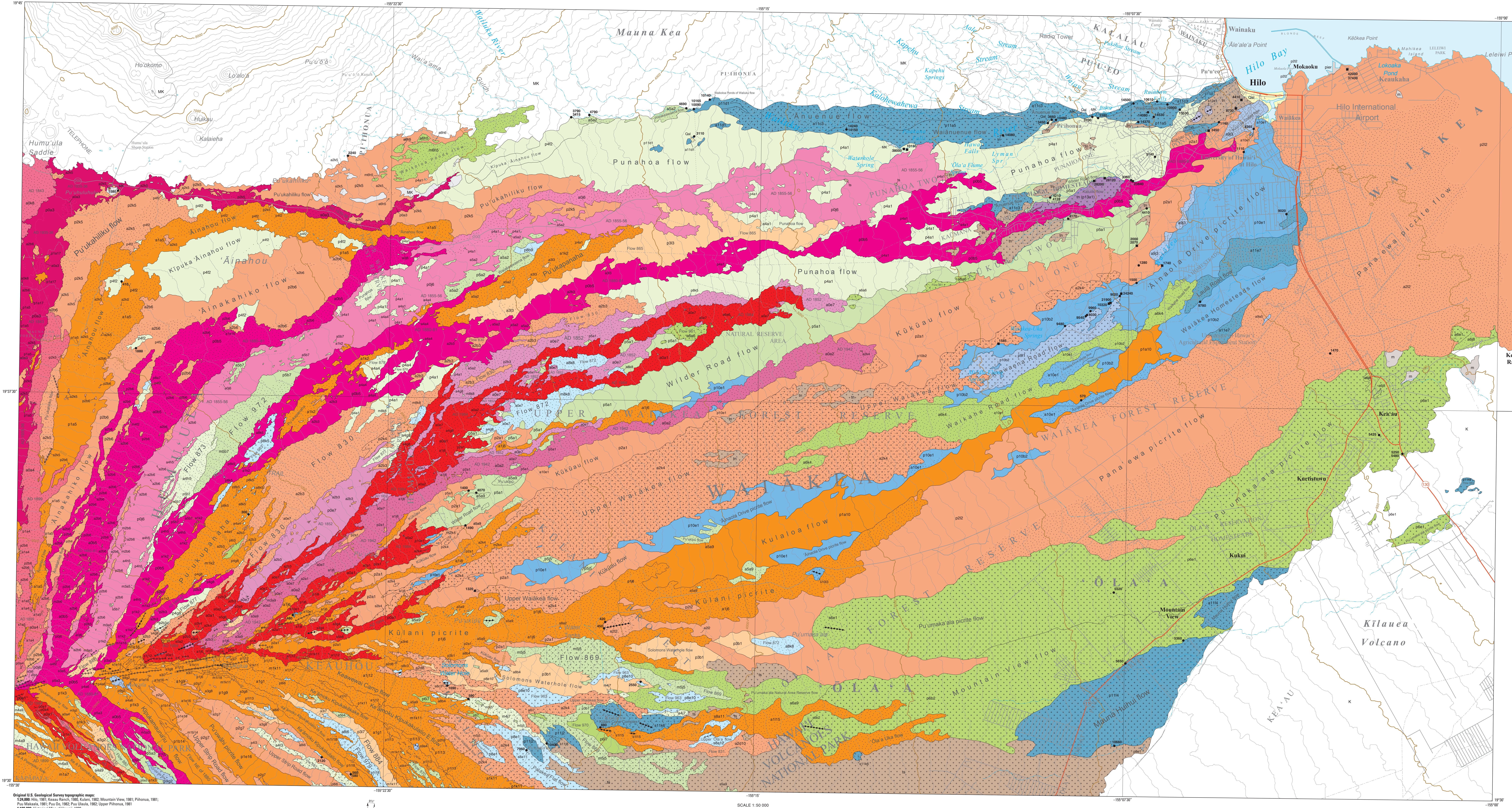

–155°30′
19°45′
–155°22′30″
–155°15′
–155°07′30″
–155°00′
–154°52′30″
19°37′30″
19°30′
Mauna Kea
Ho‘okomo
Lo‘alo‘a
Pu‘u‘ō‘ō
Pu‘u‘ō‘ō Ranch
Wai‘a‘ama
Gulch
Wailuku River
Huikau
Kalaieha
Humu‘ula Saddle
Humu‘ula Sheep Station
TELEPHONE
PI‘IHONUA
Kapehu
Kapehu Springs
Kalohewahewa
Stream
Aale
Radio Tower
KALALAU
PU‘U‘EO
Pukihae Stream
Waiau
Rainbow Falls
Boiling Pots
Pu‘u‘eo
Wainaku
Wainaku Camp
WAINAKU
‘Āle‘ale‘a Point
Hilo Bay
Hilo
Mokaoku
Mokuola Pier
pier
BLONDE REEF
Kēōkea Point
Mahikea Island
LELEIWI PARK
Leleiwi Point
Lokoaka Pond
Keaukaha
Hilo International Airport
Waiākea
University of Hawai‘i at Hilo
University of Hawai‘i Agricultural Experiment Station
Anapuka
Paukūpahu
Pāpa‘i
Pāpua‘a
Kahului
HILO TRAIL
Hā‘ena
Kea‘au Ranch
PACIFIC OCEAN
Paki Bay
Keauhou
Kea‘au
Kurtistown
Kukui
Mountain View
Kīlauea Volcano
KEA‘AU
WAIĀKEA
Waikoloa Ponds flow
Kīpuka ‘Āinahou flow
Punahoa flow
Pu‘ukahiliku flow
Pu‘uhuluhulu
‘Āinahou flow
‘Āinahou
‘Āinakahiko flow
Pu‘ukapanaha
‘Ānuenue flow
Waiānuenue flow
Waterhole Spring
Hawai‘i Falls
Lyman Spr
‘Ōla‘a Flume Spring
PUNAHOA TWO
PUNAHOA ONE
KAUMANA
Wilder Road flow
Kaluiiki flow
KŪKŪAU ONE
KŪKŪAU TWO
Kūkūau flow
‘Āinaola Drive picrite flow
Laula Road flow
Waiākea Homesteads flow
Waikahe Road flow
Kawaena Road flow
Waiākea-Uka Springs
Middle Flume Spring
Pana‘ewa picrite flow
Upper Waiākea flow
UPPER WAIĀKEA FOREST RESERVE
NATURAL RESERVE AREA
WAIĀKEA FOREST RESERVE
Kulaloa flow
Kūlani picrite
Pu‘ukīpū
Pu‘umaka‘ala
Pu‘umaka‘ala picrite flow
Pu‘umaka‘ala Natural Area Reserve flow
‘ŌLA‘A FOREST RESERVE
‘ŌLA‘A
‘ŌLA‘A RESERVATION HOMESTEADS
Mountain View flow
Mauna Huihui flow
‘Ōla‘a Uka flow
Upper ‘Ōla‘a flow
Flow 830
Flow 831
Flow 865
Flow 869
Flow 870
Flow 872
Flow 873
Flow 877
Flow 878
Flow 880
Flow 884
Flow 886
Flow 961
Flow 963
Flow 970
Flow 972
Flow 979
Flow 983
AD 1843
AD 1852
AD 1855-56
AD 1899
AD 1942
HUMU‘ULA
KEAUHOU
KŪLANI PROJECT
Solomons Water Hole
Solomons Waterhole flow
Water Tanks
Kūlani Cone Complex
Keawewai Camp flow
Ke‘āmoku Kipukakēkake flow
Ke‘āmoku Kipukakulalio E flow
Ke‘āmoku Kipukakulalio W flow
Kipukamauna‘iu flow
Pu‘uwāhi picrite flow
Upper Strip Road flow
Flow NE of 1880
Palakea Flat flow
Ke A Poomoku flow
HAWAII VOLCANOES NATIONAL PARK
KAPAPALA
MAUNA LOA FOREST RESERVE
130
11

Table 3. Explanation of map unit labels, colors, and patterns for Mauna Loa, Island of Hawai‘i, Hawaii.

[Map unit labels for lava flows and vent deposits consist of four parts that identify flow morphology, flow age group, phenocryst mineralogy, and flow number in an age group. For example, unit p10e1 is a pāhoehoe flow (p) dated 9,000 to 10,000 radiocarbon yr B.P. (10) that contains >15% olivine phenocrysts (e) and is the youngest flow in Age Group 10 (1). Materials dated include charcoal, roots, twigs, vegetative litter, or unaltered wood (rarely). All ages are reported in radiocarbon yr B.P. (before the calendar year datum of A.D. 1950). Pyroxene is not an abundant phenocryst in Mauna Loa lava flows and, therefore, is not included in phenocryst mineralogy]

Flow morphology (letter; for example p10e1)

s	Spatter, tephra, and cinder-fall deposits
p	Pāhoehoe
a	‘A‘ā
m	Mixed ‘a‘ā and pāhoehoe
l	Littoral
z	Ash deposits

Flow age group (number; for example p10e1)

0	A.D. 1843 and younger
🟥	A.D. 1984 flow
🟥	A.D. 1942 flow
🟥	A.D. 1935–36 flow
🟥	A.D. 1899 flow
🟥	A.D. 1880–81 flow
🟥	A.D. 1855–56 flow
🟥	A.D. 1852 flows
🟥	A.D. 1843 flow
1	Pre-A.D. 1832 to 1,000 yr B.P.
2	1,000–2,000 yr B.P.
3	2,000–3,000 yr B.P.
4	3,000–4,000 yr B.P.
5	4,000–5,000 yr B.P.
6	5,000–6,000 yr B.P.
7	6,000–7,000 yr B.P. (not in map area)
8	7,000–8,000 yr B.P.

Flow age group (number; for example p10e1)—*Continued*

9	8,000–9,000 yr B.P.
10	9,000–10,000 yr B.P.
11	10,000–15,000 yr B.P.
12	15,000–20,000 yr B.P.
13	20,000–30,000 yr B.P.
14	30,000–100,000 yr B.P. (not in map area)
15	>100,000 yr B.P. (not in map area)

Phenocryst mineralogy (letter; for example p10e1)

a	Aphanitic (<1% of any mineral)
b	1–5% olivine
c	5–10% olivine
d	10–15% olivine
e	>15% olivine
f	Variable amounts of olivine (2–30%)
g	1–5% plagioclase
h	5–10% plagioclase
i	Mixed, 1–5% olivine + 1–5% plagioclase
j	Mixed, >5% olivine + 1–5% plagioclase
k	Mixed, 1–5% olivine + >5% plagioclase
l	Mixed, >5% olivine + >5% plagioclase

Flow number in age group (number; for example p10e1)

1	Youngest flow in any age group
2	Next youngest flow in any age group
3	Number increases as age increases

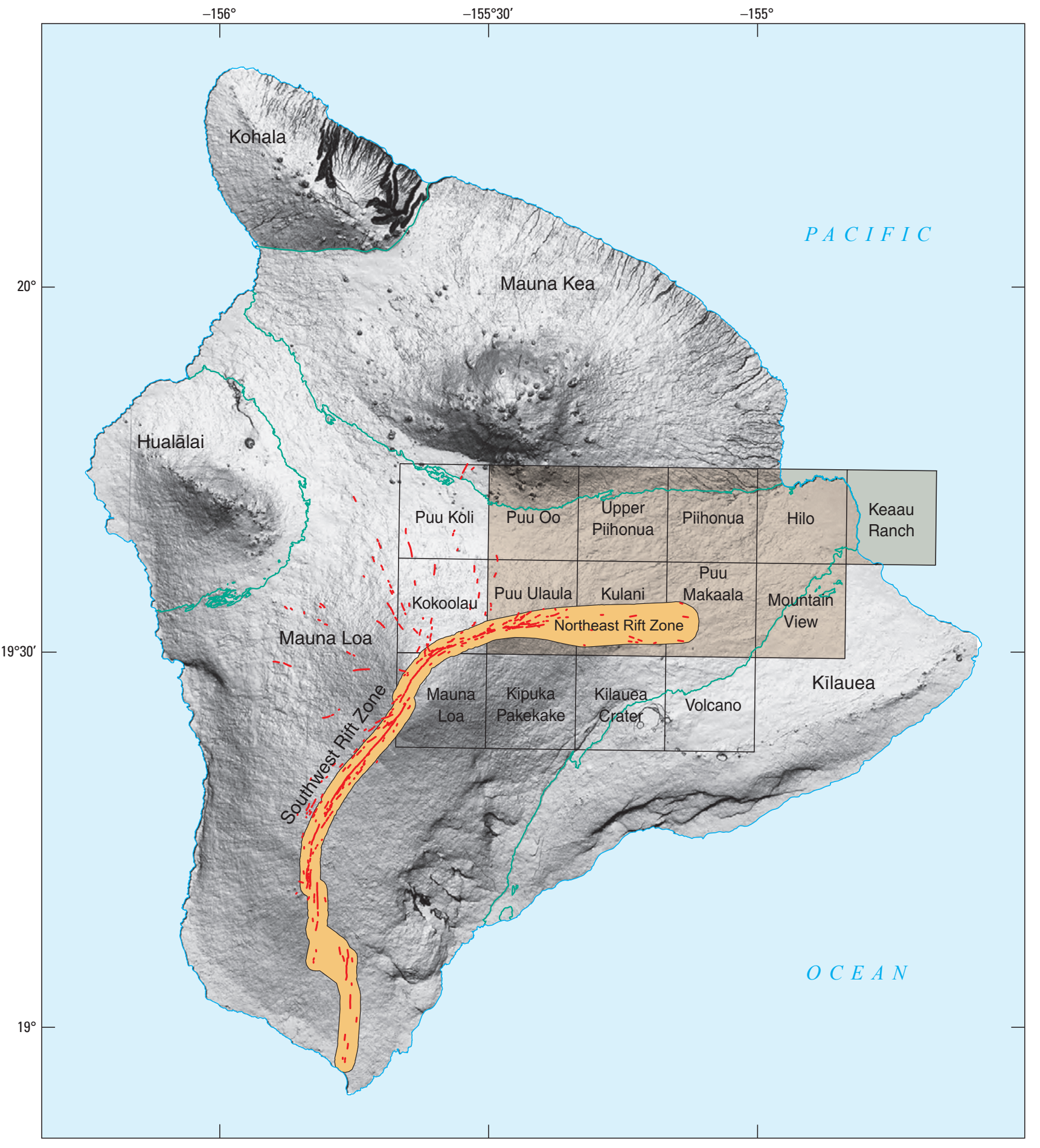
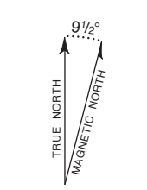

–156°
–155°30′
–155°
20°
19°30′
19°
PACIFIC
OCEAN
Kohala
Mauna Kea
Hualālai
Mauna Loa
Kīlauea
Southwest Rift Zone
Northeast Rift Zone
Puu Koli
Puu Oo
Upper Piihonua
Piihonua
Hilo
Keaau Ranch
Kokoolau
Puu Ulaula
Kulani
Puu Makaala
Mountain View
Mauna Loa
Kipuka Pakekake
Kilauea Crater
Volcano

Figure 1. Map showing subaerial volcanoes (green boundary) forming Island of Hawai‘i, fissures (red lines) on Mauna Loa, and 7.5-minute topographic quadrangles in (tan) and adjacent to map area.

Original U.S. Geological Survey topographic maps:
1:24,000: Hilo, 1981; Keaau Ranch, 1980, Kulani, 1982; Mountain View, 1981; Piihonua, 1981; Puu Makaala, 1981; Puu Oo, 1982; Puu Ulaula, 1982; Upper Piihonua, 1981
1:100,000: Historical Map of Hawaii, 1980
U.S. Geological Survey, 1:24,000, digital elevation models (DEMs) and digital line graphs (DLGs)
(https://store.usgs.gov/b2c_usgs/b2c/display/%28xcm=r3standardpitrex_prd&layout=6_1_61_50_2&uiarea=2&ctype=areaDetails&carea=0000000582%29/.do):
Contours (100 ft) interpolated from (DEMs)
Roads from DLGs, combined with TIGER/line data. Roads updated 2001 by Hawaii Department of Land and Natural Resources and Division of Forestry and Wildlife
Administrative boundaries (historic land divisions, ca. 1850 ahupua‘a boundaries and ca. 1900 coastlines) from DLGs
Hydrology polyline geodatabase extracted from DLGs
U.S. Geological Survey, 1:100,000, Historical Map of Hawaii, GEOPDF
(https://store.usgs.gov/b2c_usgs/usgs/z_lat_lon_matnr_list.do?b2cb2b=b2c&G_SEARCH_TYPE=GPDD&b2cb2b=b2c&g_search_shop_shops=16&&ZCOORD_DEC_DEG-LONGITUDE=-155.0625&ZCOORD_DEC_DEG-LATITUDE=19.63333335):
Geographic names verified December 2015 (https://geonames.usgs.gov/)
Universal Transverse Mercator projection


9½°
TRUE NORTH
MAGNETIC NORTH

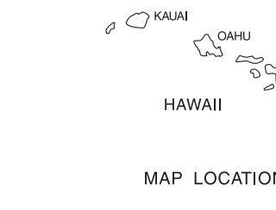
APPROXIMATE MEAN DECLINATION AT CENTER OF MAP, 2017

SCALE 1:50 000

1 ½ 0 1 2 3 4 MILES

1 .5 0 1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL


KAUAI
OAHU
HAWAII
HAWAII

MAP LOCATION

Geology mapped by J.P. Lockwood (1975–1995) and F.A. Trusdell (1987–1995)
GIS database by F.A. Trusdell
Edited by J.L. Zigler; digital cartographic production by Kathryn Nimz
Manuscript approved for publication June 30, 2006

Geologic Map of the Northeast Flank of Mauna Loa Volcano, Island of Hawai‘i, Hawaii

By

Frank A. Trusdell and John P. Lockwood

2017

THIS MAP IS NOT INTENDED FOR NAVIGATION

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