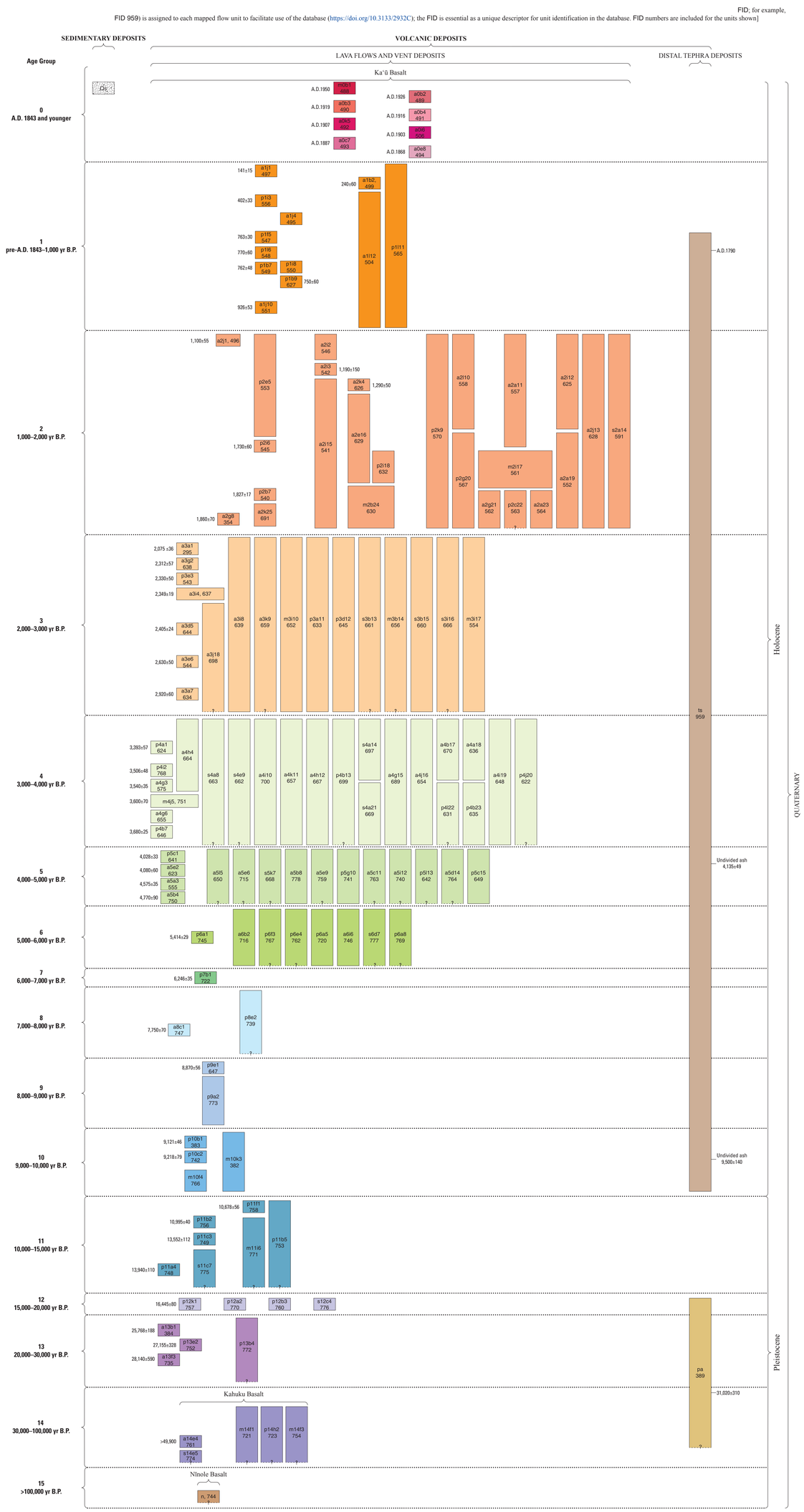


LIST OF MAP UNITS

[Some unit exposures on the printed or plotted map are not labeled to avoid obscuring data; use unit color or database (https://doi.org/10.3133/2932C) for unit identification. The simplified map unit label is not unique and provides quick access to flow morphology, flow age group, phenocryst mineralogy, and flow number in an age group (table 3, sheet 1); this non-unique unit label may be used for an entirely different unit on a different flank of Mauna Loa. We use the term "phenocryst" for any mineral ≥1 mm in maximum diameter. Pyroxene is not an abundant phenocryst in Mauna Loa lava flows; therefore, it is not included in phenocryst mineralogy. In addition to the map unit label, a unique, **three-digit flow identification number** (FID; for example, FID 959) is assigned to each mapped flow unit to facilitate use of the database for the entire Mauna Loa edifice; the FID is essential as a unique descriptor for unit identification in the database]

SEDIMENTARY DEPOSITS

Qs — **Surficial sedimentary deposits**

VOLCANIC DEPOSITS

LAVA FLOWS AND VENT DEPOSITS

Ka'ū Basalt

Age Group 0 (A.D. 1843 and younger; Holocene)

- m0b1, a0e1, m0e1, a0f1 — **A.D. 1950 flow**—FID 488
- a0b2, p0b2, s0b2 — **A.D. 1926 flow**—FID 489
- a0b3, l0b3 — **A.D. 1919 flow**—FID 490
- a0b4, s0b4 — **A.D. 1916 flow**—FID 491
- a0k5, s0k5 — **A.D. 1907 flow**—FID 492
- a0i6, p0i6 — **A.D. 1903 flow**—FID 506
- a0c7, s0c7 — **A.D. 1887 flow**—FID 493
- a0e8, p0e8, s0e8, l0e8 — **A.D. 1868 flow**—FID 494

Age Group 1 (A.D. 1843–1,000 yr B.P.; Holocene)

- a1j1, p1j1, s1j1 — **Manukā flow**—FID 497
- a1b2, s1b2, p1b2, m1c2, s1c2, m1d2, l1f2, p1e2 — **Hapaimamo flows**—FID 499
- p1i3, a1i3 — **Kīpāhoehoe flow**—FID 556
- a1j4 — **Ke A Pele o Iki flow**—FID 495
- p1f5 — **Kīpukanēnē flow**—FID 547
- p1i6, a1l6 — **Alapa'i flow**—FID 548
- p1b7 — **Waikapuna flow**—FID 549
- p1i8, a1i8 — **Flow 550**—FID 550
- p1b9, a1b9, s1b9 — **Kīpuka Kanohina flow**—FID 627
- a1j10, p1j10 — **Halepōhāhā flow**—FID 551
- p1l11, a1l11 — **Flow 565**—FID 565
- a1l12, s1l12 — **Flow 504**—FID 504

Age Group 2 (1,000–2,000 yr B.P.; Holocene)

- a2j1 — **Keāpōhina flow**—FID 496
- a2i2, p2i2, s2i2, m2i2 — **Kīpuka Pechi flow**—FID 546
- a2i3, p2i3, m2i3 — **Lua Nui flow**—FID 542
- a2k4, m2k4, s2k4, p2k4 — **Kīpukanoa flow**—FID 626
- p2e5, a2e5, m2e5, s2e5 — **Puu Ohohia flow**—FID 553
- p2i6, a2i6, m2i6, s2i6 — **Pu'u'oke'oke'o flow**—FID 545
- p2b7 — **Moa'ula flow**—FID 540
- a2g8 — **Flow 354**—FID 354
- p2k9, a2k9 — **Flow 570**—FID 570
- a2l10 — **Flow 558**—FID 558
- a2a11 — **Pāpā flow**—FID 557
- a2i12 — **Flow 625**—FID 625
- a2j13 — **Flow 628**—FID 628
- s2a14 — **Cone 591**—FID 591
- a2l15 — **Ki'olaka'a flow**—FID 541
- a2e16 — **Pōhue Bay picrite flow**—FID 629
- m2i17, p2i17, s2i17 — **Miloli'i flow**—FID 561
- p2i18 — **Kīpuka Waiahuli flow**—FID 632
- a2a19 — **Flow 552**—FID 552
- p2g20, a2g20 — **Flow 567**—FID 567
- a2g21 — **Flow 562**—FID 562
- p2c22 — **Honomalino flow**—FID 563
- a2a23 — **Kalihi flow**—FID 564
- m2b24, p2b24, a2b24, l2b24 — **Pōhue Bay flow**—FID 630
- a2k25 — **Flow 691**—FID 691

Age Group 3 (2,000–3,000 yr B.P.; Holocene)

- a3a1 — **Red Cone flow**—FID 295
- a3g2 — **Nīnole Gulch flow**—FID 638
- p3e3, a3e3, s3e3, l3e3 — **Kā'iliki'i flow**—FID 543
- a3i4, p3i4 — **Nīnole flow**—FID 637
- a3d5 — **Hōkūkano flow**—FID 644
- a3e6, p3e6, s3e6, l3e6 — **Pu'u 2847 flow**—FID 544
- a3a7 — **Flow 634**—FID 634
- a3i8 — **Puu o Lokuana flow**—FID 639
- a3k9, p3k9, s3k9 — **Kīpuka Kamiloaina flow**—FID 659
- m3i10, a3i10, p3i10 — **Flow 652**—FID 652
- p3a11 — **Paikuahiwi flow**—FID 633
- p3d12 — **Flow 645**—FID 645
- s3b13 — **Cone 661**—FID 661
- m3b14 — **Flow 656**—FID 656
- s3b15, a3b15, p3b15 — **Ihuanu flow**—FID 660
- s3i16 — **Cone 666**—FID 666
- m3i17 — **Flow 554**—FID 554
- a3j18 — **Flow 698**—FID 698

Age Group 4 (3,000–4,000 yr B.P.; Holocene)

- p4a1 — **Kauahā'ao flow**—FID 624
- p4i2 — **Flow 768**—FID 768
- a4g3 — **Flow 575**—FID 575
- a4h4, p4h4 — **Flow 664**—FID 664
- m4j5 — **Mountain House flow**—FID 751
- a4g6 — **Flow 655**—FID 655
- p4b7 — **Hi'ona'ā flow**—FID 646
- s4a8 — **Kapoalaala cone**—FID 663
- s4e9 — **Cone 662**—FID 662
- a4i10 — **Flow 700**—FID 700
- a4k11 — **Flow 657**—FID 657
- a4h12 — **Flow 667**—FID 667
- p4b13, s4b13 — **Flow 699**—FID 699
- s4a14 — **Cone 697**—FID 697
- a4g15 — **Flow 689**—FID 689
- a4j16, p4j16 — **Flow 654**—FID 654
- a4b17 — **Kīpukamālua flow**—FID 670
- a4a18 — **Flow 636**—FID 636
- a4i19 — **Flow 648**—FID 648
- p4j20 — **Flow 622**—FID 622
- s4a21, p4a21 — **Keau flow**—FID 669
- p4l22, a4l22 — **Kaulanamauna flow**—FID 631
- p4b23 — **Flow 635**—FID 635

Age Group 5 (4,000–5,000 yr B.P.; Holocene)

- p5c1 — **Wailau flow**—FID 641
- a5e2, s5e2 — **'Akihi flow**—FID 623
- a5a3 — **Flow 555**—FID 555
- a5b4, p5b4 — **Flow 750**—FID 750

Age Group 5 (4,000–5,000 yr B.P.; Holocene)—Continued

- a5i5, p5i5 — **Flow 650**—FID 650
- a5e6, p5e6 — **Flow 715**—FID 715
- s5k7 — **Pu'u 5680**—FID 668
- a5b8, m5b8, p5b8 — **Flow 778**—FID 778
- a5e9, p5e9 — **Kīpuka Kalua o Kelii Waa flow**—FID 759
- p5g10 — **Flow 741**—FID 741
- a5c11 — **Flow 763**—FID 763
- a5i12 — **Flow 740**—FID 740
- p5l13 — **Flow 642**—FID 642
- a5d14, p5d14 — **Flow 764**—FID 764
- p5c15 — **Flow 649**—FID 649

Age Group 6 (5,000–6,000 yr B.P.; Holocene)

- p6a1 — **Flow 745**—FID 745
- a6b2 — **Flow 716**—FID 716
- p6f3 — **Flow 767**—FID 767
- p6e4, a6e4 — **Flow 762**—FID 762
- p6a5 — **Flow 720**—FID 720
- a6i6 — **Flow 746**—FID 746
- s6d7 — **Kamakapaa flow**—FID 777
- p6a8 — **Flow 769**—FID 769

Age Group 7 (6,000–7,000 yr B.P.; Holocene)

- p7b1 — **Haleokāne flow**—FID 722

Age Group 8 (7,000–8,000 yr B.P.; Holocene)

- a8c1, s8c1 — **Puu Poo Puco flow**—FID 747
- p8e2, s8e2 — **Kamakalepo flow**—FID 739

Age Group 9 (8,000–9,000 yr B.P.; Holocene)

- p9e1, a9e1 — **Kāhilipali Nui flow**—FID 647
- p9a2 — **Alakaha flow**—FID 773

Age Group 10 (9,000–10,000 yr B.P.; Holocene)

- p10b1 — **Ka'ū High School flow**—FID 383
- p10c2 — **Lae'opuhili flow**—FID 742
- m10k3 — **'Iliokōloa flow**—FID 382
- m10f4 — **Flow 766**—FID 766

Age Group 11 (10,000–15,000 yr B.P.; Holocene and Pleistocene)

- p11f1 — **Honu'apo flow**—FID 758
- p11b2 — **Flow 756**—FID 756
- p11c3, s11c3 — **Puu Poopaa flow**—FID 749
- p11a4, s11a4 — **Flow 748**—FID 748
- p11b5 — **Ka'alāiki flow**—FID 753
- m11i6, a11i6, p11i6 — **Pohakuohau flow**—FID 771
- s11c7 — **Puu Kanikani cone**—FID 775

Age Group 12 (15,000–20,000 yr B.P.; Pleistocene)

- p12k1 — **Kaunāmano flow**—FID 757
- p12a2 — **Flow 770**—FID 770
- p12b3 — **Puu Hoomaha flow**—FID 760
- s12c4 — **Cone 776**—FID 776

Age Group 13 (20,000–30,000 yr B.P.; Pleistocene)

- a13b1 — **Flow 384**—FID 384
- p13e2 — **Papakōlea flow**—FID 752
- a13f3 — **Lava flow of Hi'onamoa Gulch**—FID 735
- p13b4 — **Flow 772**—FID 772

Kahuku Basalt

Age Group 14 (30,000–100,000 yr B.P.; Pleistocene)

- m14f1 — **Kahuku Pali section**—FID 721
- p14h2 — **Kipaepae flow**—FID 723
- m14f3 — **Undifferentiated basalt flows**—FID 754
- a14e4 — **Hāli'i flow**—FID 761
- s14e5 — **Puāuāomahana**—FID 774

Nīnole Basalt

Age Group 15 (>100,000 yr B.P.; Pleistocene)

- n — **Nīnole Basalt**—FID 744

DISTAL TEPHRA DEPOSITS

Tephra (Holocene and Pleistocene)

- ts — **Southern tephra**—FID 959
- pa — **Pāhala Ash**—FID 389

EXPLANATION OF MAP SYMBOLS

Contact—Approximately located. Internal contact defines flows

Fault—Ball and bar on downthrown block. Solid where certain, dashed where approximate, dotted where concealed

Fissure—Trace of fissure

Vent—Trace of vent

Ground-crack zone

Dike

Littoral deposits

'A'ā and mixed flows

Spatter

Ash—Ash (unit ts) covering flows

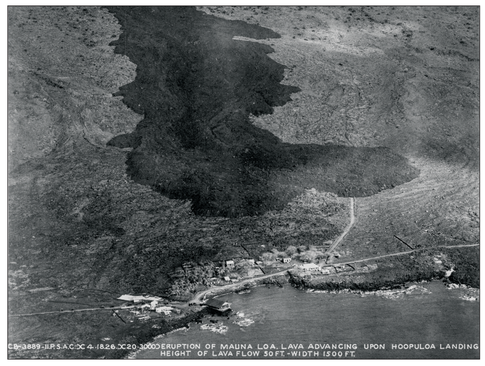
Tephra—Tephra from the eruption event(s) that formed the Hapaimamo flows (FID 499). Shown where the underlying unit is identifiable and mappable

K — **Kīlauea Volcano deposits**—Exposed in eastern part of map area

Radiocarbon-dated sample locality—Age shown in yr B.P. See table 2 (pamphlet) for analytical data; note that not all age localities are in map area

4790 — **Sample from surface flow**—Charcoal

8730 — **Sample from measured section**—Does not date surface flow



Photograph showing a lava flow from the A.D. 1926 eruption as it descends toward the village of Ho'ōpūloa near Miloli'i. U.S. Army Corps of Engineers photograph.

Photograph showing a pseudodike in a tephra cone near the top of Hawaiian Ocean View Estates. Photograph by Jim Griggs, U.S. Geological Survey.

Photograph showing an outcrop of southern ash (unit ts; FID 959) at the coast below Nā'ālehu. This ash kīpuka is surrounded by the Kāhilipali Nui flow (FID 647) dated at 8,870 yr B.P.

Panoramic photograph of Honu'apo Bay showing a sequence of 'a'ā and pāhoehoe flows. The yellow-orange soil horizon (at center) is the Pāhala Ash (unit pa, FID 389). Flows above the Pāhala Ash range in age from 20,000 to 6,000 yr B.P.

Panoramic photograph showing Puāuāomahana (FID 774), a tuff cone in Ka Lae quadrangle that is otherwise known as "Green Sand beach." The flow in the foreground is the Papakōlea flow (unit p13e2; FID 752), which overlies and surrounds Puāuāomahana, and has been dated to 27,155 yr B.P.

Panoramic view of the southern flank of Mauna Loa, from Pu'uhou to Hawaiian Ocean View Estates subdivision in the distance. From left to right, the dark flows are the A.D. 1907, A.D. 1887, and, adjacent to Pu'uhou (a littoral cone), A.D. 1868 flows. Littoral cones that follow the coastline are characteristic of Mauna Loa's Southwest Rift Zone.

Geologic Map of the Southern Flank of Mauna Loa Volcano, Island of Hawai'i, Hawaii

By
Frank A. Trusdell and John P. Lockwood

2020

Printed on recycled paper

ISSN 2329-1311 (print)
ISSN 2329-132X (online)
https://doi.org/10.3133/sim2932C

Any use of trade, product, or firm names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government

This map also is offered in an online, digital version. Users should be aware that, because of differences in rendering processes and pixel resolution, some slight distortion of scale may occur when viewing the online version on a computer screen or when printing it on an electronic plotter, even when it is viewed or printed at its intended publication scale

For sale by U.S. Geological Survey, Information Services, Box 25286, Federal Center, Denver, CO 80225, 1–888–ASK–USGS

Digital files available at https://doi.org/10.3133/sim2932C

Suggested citation: Trusdell, F.A., and Lockwood, J.P., 2020, Geologic map of the southern flank of Mauna Loa volcano, Island of Hawai'i, Hawaii: Scientific Investigations Map 2932–C, pamphlet 28 p., 2 sheets, scale 1:50,000, https://doi.org/10.3133/sim2932C.