

HAWAII OBSIDIAN SOURCES



Located on the Big Island, Pu'uwa'awa'a - the prominent cinder cone left of center in the image above - is Hawaii's only source of obsidian.

PU'U WA'AWA'A

ALTERNATE NAMES: Puuwaawaa, Puu Waawaa.

LOCATION - COUNTY: Hawaii (Big Island).

ACCESS: The gated access to the Pu'u Wa'awa'a Forest Reserve trailhead (bear left at the first Y in the road) is open from 6AM to 6PM daily. The gate is locked at 6PM. See www.puuwaawaa.org for details.

GEOLOGIC BACKGROUND/SETTING: Pu'u Wa'awa'a, located on the north slope of Hualalai Volcano, is a 1.6 km diameter cone composed of trachyte pumice and obsidian. The cone consists of crudely bedded layers of pumice and obsidian blocks. A lava flow issued from a breach in the southeast side of the horseshoe-shaped cone and flowed about 9.7 km towards the north and northeast. The flow forms a prominent ridge (up to 275 m high) downslope from the cone and is overlain in places by later basalt flows from Hualalai and Mauna Loa volcanoes. Cross (1904), in the first detailed description of the source area, suggested that additional sources of obsidian might also be located elsewhere on the Island of Hawaii. Nearly a century later, however, it appears that the Pu'u Wa'awa'a source is the lone example.

The geology and chemical composition of the Pu'u Wa'awa'a cone and flows has been discussed by Clague (1987), Clague and Hazlett (1989), Clague and Bohrsen (1991), Cross (1904), Leach and Warren (1981), Olson (1983), Macdonald et al. (1972), Powers (1920), Stearns (1985), Stearns and Macdonald (1946), Stevenson and Mills (2013), and Washington (1923).

ARCHAEOLOGICAL SIGNIFICANCE: The archaeological significance of the source is most recently discussed by McCoy et al. (2011).

ACKNOWLEDGMENTS: --.

REFERENCES

- Clague, David A.
 1987 Hawaiian Xenolith Populations, Magma Supply Rates, and Development of Magma Chambers. *Bulletin of Volcanology* 49:577-587.
- Clague, David A. and Wendy A. Bohrsen
 1991 Origin of Xenoliths in the Trachyte at Puu Waawaa, Hualalai Volcano, Hawaii. *Contributions to Mineralogy and Petrology* 108:439-452.
- Clague, David A. and Richard W. Hazlett
 1989 *Geological Field Guide to the Hawaiian Islands: Field Trip Guidebook T188/304*. American Geophysical Union, Washington, D. C.
- Clark, Jeffrey T. and Patrick V. Kirch, editors
 1983 *Archaeological Investigations of the Mudland-Waimea-Kawaihae Road Corridor, Island of Hawai'i: An Interdisciplinary Study of an Environmental Transect*. Department of Anthropology Report 83-1, Bernice Pauahi Bishop Museum, Honolulu, Hawaii.
- Cousens, B. L., D. A. Clague, and W. D. Sharp
 2003 Chronology, Chemistry, and Origins of Trachytes from Hualalai Volcano, Hawaii. *Geochemistry Geophysics Geosystems* 4(9):1-27.
- Cross, Whitman
 1904 An Occurrence of Trachyte on the Island of Hawaii. *Journal of Geology* 12:510-523.
- Duerden, P., J. R. Clayton, E. Bird, W. Ambrose³, and F. Leach
 1987 Artefact Composition and Computation. In *Archaeometry: Further Australian Studies*, edited by W. Ambrose and J. M. J. Mummery, pp. 232-238. Australian National University Press, Canberra, Australia.
- Funkhouser, J. G., I. L. Barnes, and J. J. Naughton
 1968 The Determination of a Series of Ages of Hawaiian Volcanoes by the Potassium-Argon Method. *Pacific Science* 22:369-372.
- Kirch, Patrick V.
 1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawaii Press, Honolulu, Hawaii.
- Leach, B. B. and S. E. Warren
 1981 Neutron Activation Analysis of New Zealand and Oceanic Obsidians: Towards a Simple Screening Technique. In *Archaeological Studies of Pacific Stone Resources*, edited by F. Leach and J. Davidson, pp. 151-166. B.A.R. International Series 104.
- Macdonald, Gordon A., Agatin T. Abbott, and Frank L. Peterson
 1983 *Volcanoes in the Sea: The Geology of Hawaii*. University of Hawaii Press, Honolulu, Hawaii.
- Macdonald, G. A., H. A. Powers, and T. Katsura
 1972 Interlaboratory Comparison of Some Chemical Analyses of Hawaiian Volcanic Rocks. *Bulletin Volcanologique* 36:127-139.
- McCoy, Mark D.
 2011 Geochemical Characterization of Volcanic Glass from Pu'u Wa'awa'a, Hawai'i Island. *Rapa Nui Journal* 25:41-49.
- McCoy, Mark D., Peter R. Mills, Steven Lundblad, Tim Rieth, Jennifer G. Kahn, and Rowan Gard
 2011 A Cost Surface Model of Volcanic Glass Quarrying and Exchange in Hawai'i. *Journal of Archaeological Science* 38:2547-2560.

- McCoy, Patrick, Marshall I. Weisler, Emma J. St. Pierre, Robert Bolhar, and Yuexing Feng
2015 Geochemistry and Technology of Basaltic Glass Artefacts from an Embedded Source and Two High-Altitude Base Camps in the Mauna Kea Adze Quarry Complex, Hawai'i. *Journal of Pacific Archaeology* 6(2):1-20.
- Moore, Richard B., David A. Clague, Meyer Rubin, and Wendy A. Bohrsen
1987 Hualalai Volcano: A Preliminary Summary of Geologic, Petrologic, and Geophysical Data. In *Volcanism in Hawaii*, pp. 571-585. U. S. Geological Survey Professional Paper 1350.
- Olson, L.
1983 Hawaiian Volcanic Glass Applied Dating and "Sourcing": Archaeological Context In *Archaeological Investigations of the Mudland-Waimea-Kawaihae Road Corridor, Island of Hawai'i: An Interdisciplinary Study of an Environmental Transect*, edited by Jeffrey T. Clark and Patrick V. Kirch, pp. 325-340. Department of Anthropology Report 83-1, Bernice Pauahi Bishop Museum, Honolulu, Hawaii.
- Powers, Sidney
1920 Notes on Hawaiian Petrology. *American Journal of Science* 50:256-280.
- Schousboe, Ragnar, Mary F. Riford, and Patrick V. Kirch
1983 Volcanic-Glass Flaked Stone Artifacts. In *Archaeological Investigations of the Mudland-Waimea-Kawaihae Road Corridor, Island of Hawai'i: An Interdisciplinary Study of an Environmental Transect*, edited by Jeffrey T. Clark and Patrick V. Kirch, pp. 348-370. Department of Anthropology Report 83-1, Bernice Pauahi Bishop Museum, Honolulu, Hawaii.
- Stearns, Harold T.
1985 *Geology of the State of Hawaii (2nd edition)*. Pacific Books, Palo Alto, California.
- Stearns, H. T. and G. A. Macdonald
1946 *Geology and Ground-Water Resources of the Island of Hawaii*. Hawaii Division of Hydrography Bulletin 9.
- Stevenson, Christopher M. and Peter Mills
2013 A Chronometric Tool for Hawaiian Archaeology: The Hydration Dating of Pu'u Wa'awa'a Trachytic Glass. *Journal of Archaeological Science* 40:405-415.
- Washington, Henry S.
1923 Petrology of the Hawaiian Islands. *American Journal of Science* 6:101-126.
- Weisler, Marshall
1990 Sources and Sourcing of Volcanic Glass in Hawai'i: Implications for Exchange Studies. *Archaeology in Oceania* 25:16-23.

2012 Polynesian Volcanic Glass: Uses, Sourcing, and Distribution. In *Obsidian and Ancient Manufactured Glasses*, edited by Ioannis Liritzis and Christopher M. Stevenson, pp. 130-142. University of New Mexico Press, Albuquerque, New Mexico.
- Wolfe, Edward W. and Jean Morris
1996 *Geologic Map of the Island of Hawaii*. U. S. Geological Survey Map I-2524-A, scale 1:100,000.