

## OREGON OBSIDIAN SOURCES



A panoramic view of Newberry Caldera from the summit of Paulina Peak. Several different post-Mazama obsidian flows that fall into the Newberry Volcano source group are found within the caldera. The prominent Big Obsidian Flow in the right side of the image above belongs to a separate distinct chemical source group.

### NEWBERRY VOLCANO

*“...we had for some distance not a stony road but really a flinty one of a very large size.”*

A description of the passage through Newberry Caldera from the journal of Peter Skene Ogden (1826-27)

**ALTERNATE NAMES:** Central Pumice Cone Flow, East Lake Flows, Game Hut Flow, Interlake Flow (Inter Lake, North Flow, T Flow), Little Obsidian Flow, Newberry Caldera.

**GEOCHEMICAL SOURCE:** Newberry Volcano.

**LOCATION - COUNTY:** Deschutes.

**ACCESS AND OWNERSHIP:** Newberry National Volcanic Monument; a parking permit is required in the caldera. Access limited by snow in winter months. Collection of obsidian samples in the monument is by permit only.

**ARCHAEOLOGICAL SIGNIFICANCE:** The rapid adoption and widespread prehistoric use of Newberry Volcano obsidian in the period following the eruption of the flows is well documented in central and northcentral Oregon. Characterized artifacts from this source are occasionally found at sites in the Western Cascades, southwest Oregon, northwest Oregon, and Washington, and has been reported from as far north as British Columbia, Canada.

**GEOCHEMICAL NOTES:** The Newberry Volcano geochemical source is a composite chemical source consisting of several geochemically indistinguishable (using XRF analytical methods) Holocene obsidian flows (Central Pumice Cone, East Lake, Game Hut, and Interlake flows) located within Newberry Caldera (Newberry National Volcanic Monument). All of the flows making up this geochemical group erupted after the Mazama ashfall of about 6,850 <sup>14</sup>C years ago, providing a unique window that temporally brackets the prehistoric use of the glass.

**ACKNOWLEDGMENTS:** Kathy Davis.

## REFERENCES

- Ambroz, Jessica A.  
 1997 *Characterization of Archaeologically Significant Obsidian Sources in Oregon by Neutron Activation Analysis*. Unpublished Master's Thesis, Department of Chemistry, University of Missouri, Columbia, Missouri.
- Baxter, Paul W., Thomas J. Conolly, and Craig E. Skinner  
 2015 Obsidian Use in the Willamette Valley and Adjacent Western Cascades of Oregon. In *Toolstone Geography of the Pacific Northwest*, edited by Terry L. Ozburn and Ron L. Adams, pp. 218-233. Archaeology Press, Simon Fraser University, Burnaby, British Columbia.
- Beyer, Robert L.  
 1973 *Magma Differentiation at Newberry Crater in Central Oregon*. Unpublished Ph.D. Dissertation, Department of Geology, University of Oregon, Eugene, Oregon.
- Black, Gerald L.  
 1982 An Estimate of the Geothermal Potential of Newberry Volcano, Oregon. *Oregon Geology* 44:44-46.
- Carlson, Roy L.  
 1994 Trade and Exchange in Prehistoric British Columbia. In *Prehistoric Exchange Systems in North America*, edited by Timothy G. Baugh and Jonathon E. Ericson, pp. 307-361. Plenum Press, New York, New York.
- Conolly, Thomas J.  
 1999 *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*. University of Utah Anthropological Papers No. 121, Salt Lake City, Utah.
- Conolly, Thomas J., Craig E. Skinner, and Paul W. Baxter  
 2015 Ancient Trade Routes for Obsidian Cliffs and Newberry Volcano Toolstone in the Pacific Northwest. In *Toolstone Geography of the Pacific Northwest*, edited by Terry L. Ozburn and Ron L. Adams, pp. 180-192. Archaeology Press, Simon Fraser University, Burnaby, British Columbia.
- Fiebelkorn, Robin B., George W. Walker, Norman S. MacLeod, Edwin H. McKee, and James G. Smith  
 1982a *An Index to K-Ar Age Determinations for the State of Oregon*. U.S. Geological Open-File Report 82-596.  
 1982b Index to K-Ar Determinations for the State of Oregon. *Isochron/West* 37.
- Fink, Jonathan H. and Steven W. Anderson  
 2017 *Emplacement of Holocene Silicic Lava Flows and Domes at Newberry, South Sister, and Medicine Lake Volcanoes, California and Oregon*. U. S. Geological Survey Special Investigations Report 2017-5022-I.
- Flenniken, J. Jeffrey, and Terry L. Ozburn  
 1988 *Archaeological Investigations in Newberry Crater, Deschutes National Forest, Central Oregon*. Report prepared for the Deschutes National Forest, Contract No. 53-04GG-7-03430, Bend, Oregon. Lithic Analysts Research Report No. 4, Pullman, Washington.
- Friedman, Irving  
 1977 Hydration Dating of Volcanism at Newberry Crater, Oregon. *Journal of Research of the U.S. Geological Survey* 5:337-342.
- Friedman, Irving and W. D. Long  
 1976 Hydration Rate of Obsidian. *Science* 191:347-352.
- Friedman, Irving and John Obradovich  
 1981 Obsidian Hydration Dating of Volcanic Events. *Quaternary Research* 16:37-47.
- Friedman, Irving and F. W. Trembour  
 1978 Obsidian: The Dating Stone. *American Scientist* 66:44-51.

- 1983 Obsidian Hydration Dating Update. *American Antiquity* 48:544-547.
- Friedman, Irving, Fred W. Trembour, Franklin L. Smith, and Georgie I. Smith  
 1994 Is Obsidian Hydration Dating Affected by Relative Humidity? *Quaternary Research* 41:185-190.
- Higgins, Michael W.  
 1968 *The Geology of Newberry Crater, Central Oregon*. Unpublished Ph.D. Dissertation, Department of Geology, University of California, Santa Barbara.
- 1973 Petrology of Newberry Volcano, Central Oregon. *Geological Society of America Bulletin* 84:455-488.
- Higgins, Michael W. and Aaron C. Waters  
 1967 Newberry Caldera, Oregon: A Preliminary Report. *Ore Bin* 29:37-60.
- 1968 Newberry Caldera Field Trip. In *Andesite Conference Guidebook*, edited by H. Dole, pp. 59-77. Oregon Department of Geology and Mineral Industries Bulletin 62, Portland, Oregon.
- Hughes, Richard E.  
 1986 *Diachronic Variability in Obsidian Procurement Patterns in Northeastern California and Southcentral Oregon*. University of California Publications in Anthropology 17, Berkeley, California.
- Jensen, Robert E., Julie M. Donnelly-Nolan, and Daniele McKay  
 2009 A Field Guide to Newberry Volcano, Oregon. In *Volcanoes to Vineyards: Field Trips through the Dynamic Landscape of the Pacific Northwest*, edited by J. E. O'Connor, R. J. Dorsey, and I. P. Madin, pp. 53-79. Geological Society of America Field Guide 15.
- Kassa, Sonja C.  
 2014 *The Archaeology of Obsidian Occurrence in Stone Tool Manufacture and Use Along the Mid-Columbia River, Washington*. Unpublished Master's Thesis, Department of Resource Management, Central Washington University, Ellensburg, Washington.
- Kassa, Sonja C. and Patrick T. McCutcheon  
 2016 The Archaeology of Obsidian Occurrence in Stone Tool Manufacture and Use Along Two Reaches of the Northern Mid-Columbia River, Washington. *Journal of Northwest Anthropology* 50:79-102.
- Linneman, Scott R.  
 1990 *The Petrologic Evolution of the Holocene Magmatic System of Newberry Volcano, Central Oregon*. Unpublished Ph.D. Dissertation, Department of Geology and Geophysics, University of Wyoming, Laramie, Wyoming.
- Laidley, Richard A. and David S. McKay  
 1971 Geochemical Examination of Obsidians from Newberry Caldera, Oregon. *Contributions to Mineralogy and Petrology* 30:336-342.
- Linck, James C.  
 1945 *Paulina Preferred*. Binfords & Mort, Portland, Oregon.
- MacLeod, Norman S. and E. A. Sammel  
 1982 Newberry Volcano, Oregon: A Cascade Range Geothermal Prospect. *Oregon Geology* 44:123-131.
- MacLeod, Norman S. and David R. Sherrod  
 1988 Geologic Evidence for a Magma Chamber Beneath Newberry Volcano, Oregon. *Journal of Geophysical Research* 93(B9):10,067-10,079.
- MacLeod, Norman S., David R. Sherrod, Lawrence A. Chitwood, and Robert A. Jensen  
 1995 *Geologic Map of Newberry Volcano, Deschutes, Klamath, and Lake Counties, Oregon*. U. S. Geological Survey Miscellaneous Investigations Series I-2455, scale 1:62,500 and 1:24,000.

- MacLeod, Norman S., David R. Sherrod, Lawrence A. Chitwood, and Edwin H. McKee  
 1981 Newberry Volcano, Oregon. In *Guides to Some Volcanic Terranes in Washington, Idaho, Oregon and Northern California*, edited by D. A. Johnston and J. Donnelly-Nolan, pp. 85-103. U. S. Geological Survey Circular 838.
- Marschall, Mary E.  
 2004 *A Primary Regional Analysis of Lithic Cache Sites in Central Oregon*. Unpublished Master's Thesis, Interdisciplinary Studies, Oregon State University, Corvallis, Oregon.
- Minor, Rick  
 2013 Great Basin Obsidian at The Dalles: Implications for the Emergence of Elites in the Southwestern Plateau. *Journal of Northwest Anthropology* 47:25-46.
- Musil, Robert R. and Brian O'Neill  
 1997 Source and Distribution of Archaeological Obsidian in the Umpqua River Basin of Southwest Oregon. In *Contributions to the Archaeology of Oregon: 1995-1996*, edited by Albert Oetting, pp. 123-162. Association of Oregon Archaeologists Occasional Papers No. 6, Eugene, Oregon.
- Ogden, Peter S.  
 1961 *Peter Skene Ogden's Snake Country Journal, 1826-27*, edited by K. G. Davies. Robert MacLehose and Co., Ltd., The University Press, Glasgow, Scotland.
- Ozbun, Terry L.  
 1991 Boulders to Bifaces: Initial Reduction of Obsidian at Newberry Crater, Oregon. *Journal of California and Great Basin Anthropology* 13:147-159.
- Peterson, Norman V. and E. A. Groh  
 1965 *Lunar Geological Field Conference Guide Book*. Oregon Department of Geology and Mineral Industries Bulletin 57, Portland, Oregon.
- 1969 The Ages of Some Holocene Volcanic Eruptions in the Newberry Volcano Area, Oregon. *Ore Bin* 31:73-87.
- Peterson, Norman V., Edward A. Groh, Edward M. Taylor, and Donald E. Stensland  
 1976 *Geology and Mineral Resources of Deschutes County, Oregon*. Oregon Department of Geology and Mineral Industries Bulletin 89, Portland, Oregon.
- Robinson, Joel E., Julie Donnelly-Nolan, and Robert A. Jensen  
 2015 *Newberry's Youngest Lava Flows*. U. S. Geological Survey Scientific Investigations Map 3329.
- Russell, Israel C.  
 1905 *Preliminary Report on the Geology and Water Resources of Central Oregon*. U. S. Geological Survey Bulletin 252.
- Sappington, Robert L.  
 1981 A Progress Report on the Obsidian and Vitrophyre Sourcing Project. *Idaho Archaeologist* 4(4)4-17.
- Skinner, Craig E.  
 1983 *Obsidian Studies in Oregon: An Introduction to Obsidian and An Investigation of Selected Methods of Obsidian Characterization Utilizing Obsidian Collected at Prehistoric Quarry Sites in Oregon*. Unpublished Master's Terminal Project, Interdisciplinary Studies, University of Oregon, Eugene, Oregon.
- 1995a Obsidian Characterization Studies. In *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California, Volume V: Technical Studies*, by Robert U. Bryson, Craig E. Skinner, and Richard M. Pettigrew, pp. 4.1-4.54. Report prepared for Pacific Gas Transmission Company, Portland, Oregon, by INFOTEC Research Inc., Fresno, California, and Far Western Anthropological Research Group, Davis, California.
- 1995b Obsidian Hydration Studies. In *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California, Volume V: Technical Studies*, by Robert U. Bryson, Craig E. Skinner, and Richard M. Pettigrew, pp. 5.1-5.51. Report prepared for Pacific Gas Transmission Company, Portland, Oregon, by INFOTEC Research, Inc., Fresno, California, and Far Western Anthropological Research Group, Davis, California.

1995c Obsidian Sources Identified During PEP Studies. In *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California, Volume V: Technical Studies*, by Robert U. Bryson, Craig E. Skinner, and Richard M. Pettigrew, pp. C5.1-C5.11. Report prepared for Pacific Gas Transmission Company, Portland, Oregon, by INFOTEC Research, Inc., Fresno, California, and Far Western Anthropological Research Group, Davis, California.

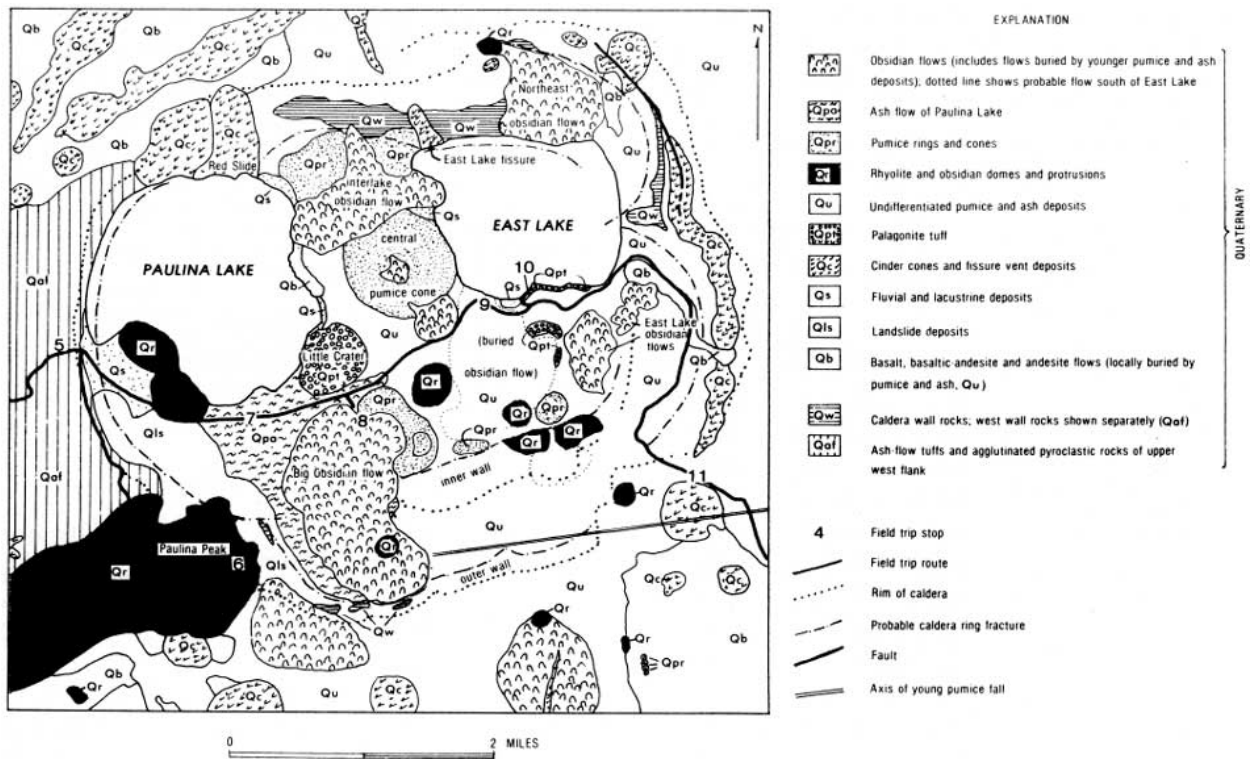
Skinner, Craig E. and Carol J. Winkler

1991 Prehistoric Trans-Cascade Procurement of Obsidian in Western Oregon: The Geochemical Evidence. *Current Archaeological Happenings in Oregon* 16(2):3-9.

1994 Prehistoric Trans-Cascade Procurement of Obsidian in Western Oregon: A Preliminary Look at the Geochemical Evidence. In *Contributions to the Archaeology of Oregon: 1989-1994*, edited by Paul Baxter, pp. 29-44. Association of Oregon Archaeologists Occasional Papers No. 5, Eugene, Oregon.

Williams, Howel

1935 Newberry Volcano of Central Oregon. *Geological Society of America Bulletin* 46:253-304.



Simplified geologic map of Newberry Caldera from MacLeod et al. (1981).