

ARCHAEOLOGY ON THE MONUMENT: OBSIDIAN

In Celebration of Newberry National Volcanic Monument



Obsidian at The Big Obsidian Flow

Newberry Volcano and Obsidian Use in the Prehistoric Period

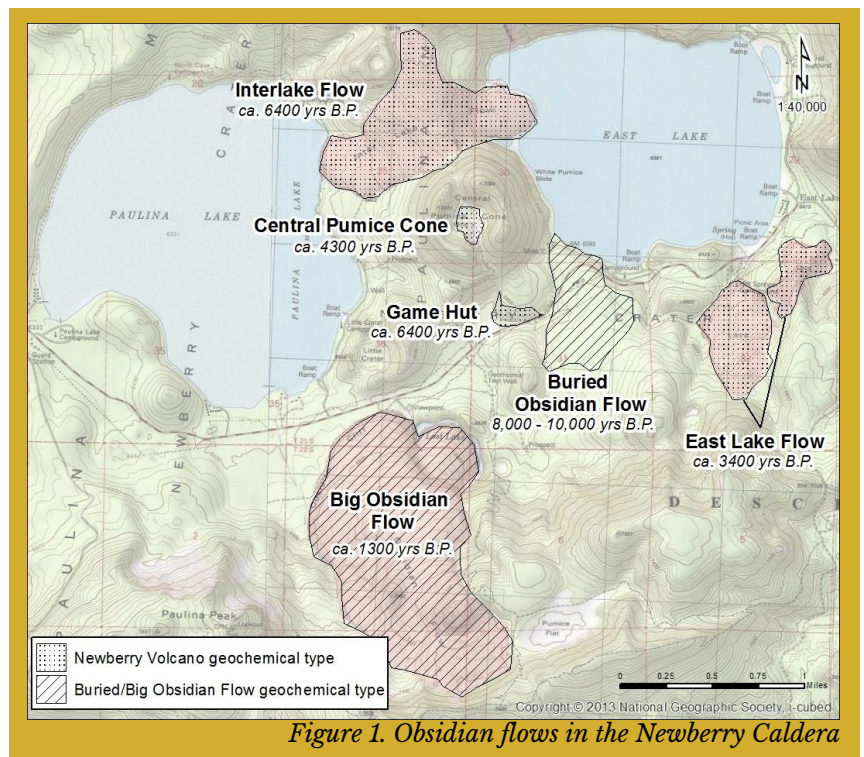
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The volcanic activity that formed the unique landscape of the Newberry National Volcanic Monument also created deposits of obsidian; a resource highly valued during the prehistoric period for making stone tools. Obsidian deposits have distinct geochemical properties that can be identified using a technique called x-ray fluorescence spectrometry. X-ray fluorescence spectrometry measures select major, minor, and trace rare earth elements in samples of volcanic rock. Obsidian from Newberry has a chemical makeup, or signature, that is different than obsidian from, for example, Obsidian Cliffs in the Cascade Mountains or Glass

Buttes in central Oregon. Researchers use x-ray fluorescence spectrometry, commonly referred to as “obsidian sourcing,” on artifacts discovered at archaeological sites to gain a better understanding of past human activities, and in particular, trade networks. Obsidian sourcing of artifacts indicates where people obtained raw material for making stone tools and helps build a picture of the movement of people and/or goods. Dr. Thomas Connolly of the University of Oregon, Museum of Natural and Cultural History and Dr. Richard Hughes, founder of the Geochemical Research Laboratory, analyzed obsidian source data from archaeological sites across the Pacific Northwest and found an interesting pattern in the use of Newberry Volcano obsidian through time (Connolly 1999; Connolly et al. 2015).

The Newberry Volcano has produced a number of obsidian flows which were quarried for toolstone during the prehistoric period. The Buried Obsidian Flow was the only obsidian source within the caldera in the early Holocene, ca. 10,000 years ago (Figure 1). The eruption of Mt. Mazama ca. 7600 years ago and subsequent

eruptions of Newberry buried the Buried Obsidian Flow beneath volcanic deposits, making it inaccessible for quarrying. This volcanic activity also created new obsidian flows and between ca. 7000 and 3000 years ago, the Interlake, Central Pumice Cone, Game Hut, and East Lake obsidian flows formed. These four obsidian flows make up what is referred to as the Newberry Volcano geochemical type - all four flows display the same



chemical signature. The Big Obsidian Flow, which was extruded ca. 1300 years ago, shares the same chemical makeup as the Buried Obsidian Flow. Artifacts made of obsidian from the Buried Obsidian Flow (the oldest obsidian flow in the caldera) and

the Big Obsidian Flow (the youngest obsidian flow in the caldera) are indistinguishable from each other, but are chemically distinct from the Interlake, Central Pumice Cone, Game Hut, and East Lake flows which make up the Newberry Volcano geochemical type.

In the 1990s, Dr. Thomas Connolly conducted extensive archaeological investigations in the Newberry Caldera in anticipation of the rerouting of the Paulina Lake Road (Forest Service road 21). The research included examining the distribution of Newberry Volcano obsidian found at archaeological sites across the Pacific Northwest (Connolly 1999). Dr. Connolly and Dr. Hughes found that obsidian from the Newberry Volcano geochemical type (Interlake, Central Pumice Cone, Game Hut, and East Lake flows) displayed a distinct distribution pattern northward up the Deschutes River basin to the Columbia Plateau trading site at The Dalles. From there, artifacts from the Newberry volcanic geochemical type continued northward along the crest of the Cascades and into the Puget Sound-Gulf of Georgia region. Interestingly, artifacts composed from the Newberry Volcanic geochemical type are not frequently found to the south or east of the caldera. Connolly and Hughes also discovered that obsidian artifacts from the Buried/Big Obsidian Flow geochemical type are not commonly found outside the general vicinity of Newberry (Connolly et al. 2015:181). Meaning, obsidian that was available to quarry prior to ca. 7600 years ago (the Buried Obsidian Flow) and obsidian available to quarry after ca. 1300 (the Big Obsidian Flow) is typically only found locally. This information, combined with Dr. Connolly's extensive archaeological research at the Newberry Caldera, led to the postulation that Newberry Volcano obsidian was part of a northern trade network operating most intensively between ca. 4000 and 1000 years ago (Connolly et al. 2015:184).

See references below.

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References:

- Connolly, Thomas
1999 *Newberry Crater: A Ten-Thousand Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*. University of Utah Anthropological Papers, Number 121. University of Utah Press, Salt Lake City, Utah.
- Connolly, Thomas J., Craig E. Skinner, Paul W. Baxter
2015 *Toolstone Geography of the Pacific Northwest*. Edited by Terry Ozbun and Ron L. Adams pp 180-192. Archaeology Press, Simon Fraser University.