Obsidian Procurement and Use at the Dry Creek Site (HEA-005), Interior Alaska

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Geochemical analyses of obsidian artifacts play an important role in gaining behavioral insights into the earliest inhabitants of Alaska. In Alaska, few well-stratified, multicomponent sites exist with occupations that span the late-Pleistocene and Holocene periods. Even rarer are sites that have obsidian

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throughout most or all of the stratigraphic column. Here we report on geochemical analyses of obsidian artifacts recovered from one such site—Dry Creek (HEA-005)—located in the Nenana River valley of central Alaska.

The Dry Creek site is situated approximately 125 km southwest of Fairbanks on a glacial outwash terrace that overlooks Dry Creek. Nearly 2 m of stratified loess and eolian sand deposits with 5 interspersed paleosol complexes overlie glacial outwash (Hoffecker et al. 1996; Thorson and Hamilton 1977). Three components (C-I, C-II, and C-IV) that span over 7,000 years of intermittent use were identified at the site. C-I is dated to 11,120 ± 85 RCYBP and is assigned to the Nenana complex. C-II is associated with a paleosol dated to 10,690 ± 250 and 10,615 ± 100 RCYBP and is assigned to the Denali complex. C-IV dates between 4670 ± 95 and 3430 ± 75 RCYBP and is assigned to the Northern Archaic tradition.

A total of 60 obsidian artifacts from the site were analyzed by neutron activation analysis (NAA), X-ray fluorescence (XRF), or laser ablation inductively coupled plasma mass spectroscopy (LA-ICP-MS). Although no obsidian was recovered from C-I, obsidian from several sources was encountered in C-II. Thus far, 10 samples from Batza Téna (335 km northwest) have been identified including two biface fragments. In addition to Batza Téna, obsidian with no known geological location, referred to as Group K (Cook 1995), was first encountered at this site. Group K obsidian has no distinct visual characteristics and looks similar to Batza Téna obsidian in quality. Thirty-seven artifacts from Group K were identified including three medial microblade fragments, a microblade core tablet, and burin spall. Cook (1995) mistakenly reported artifacts of Group A (Wiki Peak source) obsidian in C-II, but provenience information for those samples indicates they were recovered from C-IV.

Multiple activity areas were identified for 14 artifact clusters (A–N) in C-II, including microblade-inset weaponry manufacture and maintenance, bifacial projectile-point production, hide working, and butchering (Powers and Hoffecker 1989; Powers et al. 1983). Obsidian artifacts are associated with 5 of the 14 artifact clusters (clusters B, C, D, G, I). Batza Téna obsidian is associated with clusters that are interpreted as related to microblade manufacturing (cluster C), and bifacial-tool production and maintenance and butchering (cluster D). Group K obsidian is associated with activity areas that include microblade manufacturing and spear maintenance (clusters B and G), bifacial-tool production and maintenance, and butchering (clusters D and I). Both varieties of obsidian are associated with clusters that reflect multiple activities. A limited analysis of formal artifact types from C-II indicated that Batza Téna obsidian was used predominantly for bifacial-tool manufacture, whereas Group K obsidian was used for microblade production.

In general, the relatively small size of artifacts attributed to Group K (average maximum dimension of 21 samples is 15 mm, and the largest maximum dimension is 45 mm) indicates that package size and shape of available raw materials from this group likely constrained the use of this source to a microlithic technology (Reuther et al. 2008). Group K obsidian has been found at HEA-232, HEA-391, LIV-054, XMH-277, and XMH-284, with at least two of these sites associated with microblade technology. Geographic distribu-

tion of Group K is restricted to interior Alaska, with the majority of the sites located in the northern Alaska Range.

During the subsequent Dry Creek occupation(s) represented by C-IV, only obsidian from the Wiki Peak area (Group A), located approximately 455 km to the southeast, was used. Thirteen Wiki Peak samples were identified in this component, including six scrapers and a side-notched point. While the earliest occupations (ca. 11,000 RCYBP) in the Nenana Valley, such as the Nenana component at Walker Road, utilized Wiki Peak obsidian (Speakman et al. 2008), the C-II occupants at Dry Creek did not. This is surprising, since obsidian seems to be a highly utilized raw material at this site compared with other sites in the region (Powers et al. 1983). It also is of interest that the C-IV occupants focused solely on procuring Wiki Peak obsidian. Although the sample size is small, our data indicate that emphasis shifted to acquiring materials from the east, rather than from the north (i.e., Batza Téna). Future research will hopefully address whether differential preference of obsidian sources/groups is a real phenomenon or just related to sampling. Further research also should focus on how obsidian raw materials influenced typological and technological variability in the Dry Creek and other interior Alaskan lithic assemblages.

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