Clovis Obsidian Sources in the Central Rio Grande Rift Region of New Mexico

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Recent analyses of privately held collections (Hamilton 2008; Hill, et al. 2007) and excavations at Mockingbird Gap (Holliday, et al. 2009; Huckell, et al. 2008; Huckell, et al. 2007; Huckell, et al. 2006) indicate a substantial Clovis occupation of the central Rio Grande Rift region of New Mexico. Clovis tool-

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stone raw materials include various cherts, chalcedonies, and quartzites, but are dominated by rhyolites and obsidians, which are available throughout this part of the western Cordillera owing to a long geological history of volcanism, caldera formation, crustal extension, and block-faulting (Baldridge, et al. 1995). In this paper we report the results of sourcing 18 obsidian artifacts (15 point fragments and 3 flakes) from 3 Clovis assemblages from the central Rio Grande Rift region of the southwestern United States. The points are from the Robert H. Weber collection, and include 10 Clovis point fragments from the Mockingbird Gap surface collection, and 5 point fragments from Socorro and Catron counties in west central New Mexico. The three flakes were recovered in situ during the 2007 field season excavations at Mockingbird Gap (Huckell, et al. 2008). The artifacts were chemically characterized using energy-dispersive X-ray fluorescence (EDXRF) by the Geoarchaeological XRF lab at University of California, Berkeley (Shackley 2006). All artifacts were traced to known sources (Figure 1), including Cerro Toledo rhyolite, El Rechuelos, and Valles rhyolite from the Jemez Mountains of New Mexico (ca. 250 km from Mockingbird Gap), Grants Ridge obsidian, from Mt. Taylor, New Mexico (ca. 180 km), and Cow Canyon in east-central Arizona, (> 400 km) (Shackley 2005).

There was considerable overlap among obsidian sources across the three assemblages. Eight artifacts from Mockingbird Gap were sourced to the Jemez Mountains (six Cerro Toledo rhyolite and two Valles rhyolite), one to Mt. Taylor, and one to Cow Canyon. Four of the Socorro-Catron counties points were sourced to the Jemez Mountains (two Cerro Toledo rhyolite, and two El Rechuelos), and one to Cow Canyon. From the excavated sample, all three flakes sourced to Mt. Taylor, and a fourth was provisionally identified as Cerro Toledo rhyolite, but was too small for conclusive assignment. The Cow Canyon source is particularly interesting since it is also the principal source of obsidian recovered at the Murray Springs Clovis site, Arizona (Shackley 2007, Shackley 2008), and is present in both the Mockingbird Gap and survey assemblages. Whether this shared obsidian source indicates direct contact between Clovis populations in the Rio Grande Valley and the San Pedro River valley, or simply overlapping knowledge of a high-quality toolstone source is unknown.

Obsidian nodules from the Mount Taylor source are available in secondary contexts along the Rio Salado, and small obsidian nodules from both the Cerro Toledo and El Ruechelos sources are available in secondary contexts within the Tertiary-Quaternary alluvium along the Rio Grande, though not large enough for point manufacture as far south as Socorro (Church 2000; Shackley 2005). However, the Valles rhyolite obsidian is only available in the Valles Caldera, requiring direct procurement from the source.

The distribution of obsidian toolstone sources indicates that Clovis hunter-gatherers in the central Rio Grande Rift region had extensive knowledge of a wide region, including the Mogollon Rim country, the southern Rockies, the various mountain ranges west of the Rio Grande Valley, and the Valley itself. Indeed, these sources include many of the highest-quality obsidian sources in the region. Future toolstone sourcing of these assemblages will focus on the most dominant raw material, "Socorro Jasper", a silicified rhyolite with multiple sources in the mountains west and southwest of Socorro (Dello-Russo 2004).

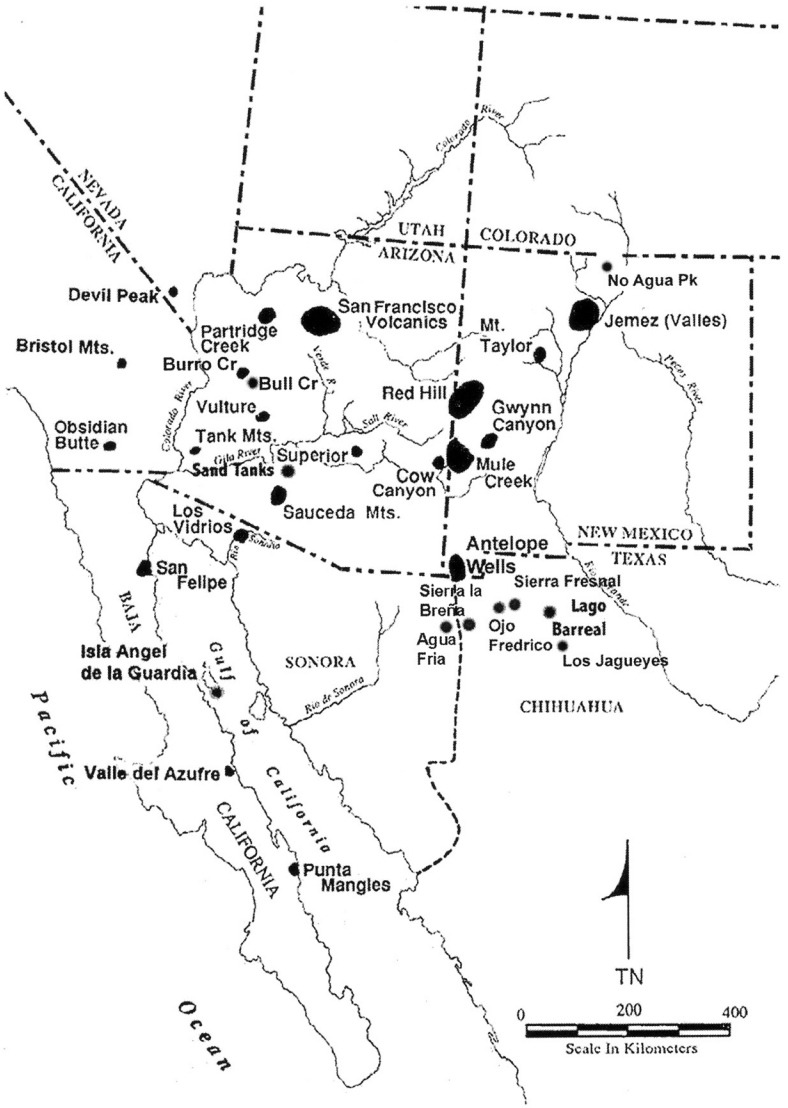

Figure 1. Known obsidian sources in the southwestern United States and northern Mexico,

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