

**Obsidian Procurement and Social Interaction at West Baker (LA 83574), a Classic
Mimbres Site Beyond the Mimbres Heartland**

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Introduction

Approximately 100 km southwest of the Mimbres Valley sits the West Baker site (LA 83574) in Hidalgo County, southwest New Mexico (Figure 1). Eugene McCluney (1964) excavated West Baker, and based on the presence of Mimbres Classic Style III Black-on-white pottery and other lines of evidence, people lived there during the Mimbres Classic period (A.D. 1000-1130). West Baker is unique in that it is the area's largest known Classic Mimbres site with at least 23 rooms, and McCluney (1968) found a shrine filled with turquoise, marine shell, and other artifacts.

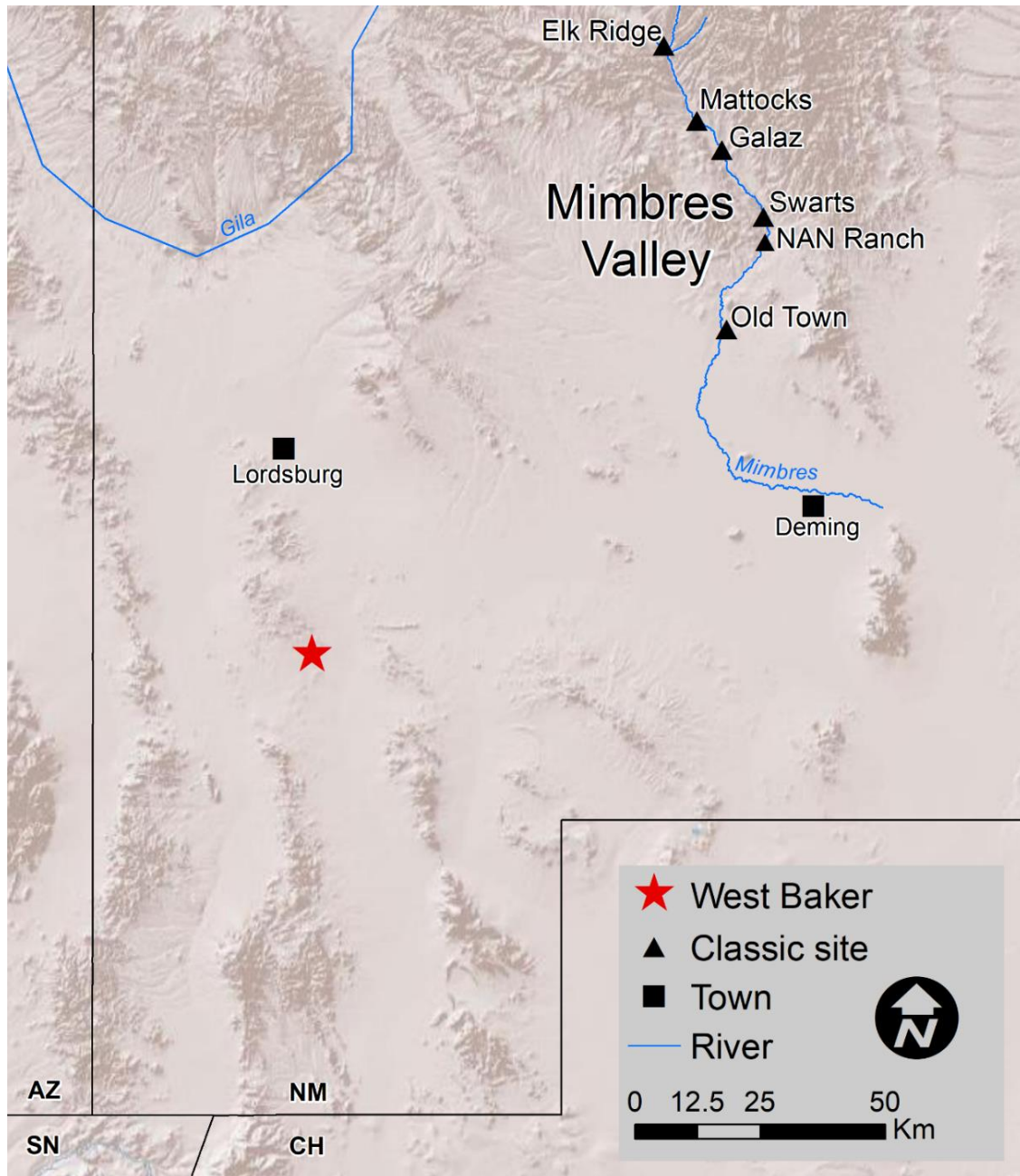


Figure 1. The location of West Baker, the Mimbres Valley, and the sites mentioned in the text.

Much of what archaeologists know about how people lived during the Classic period drives from excavations in the Mimbres Valley heartland along the Mimbres River at sites like Mattocks, Galaz, Swarts, NAN Ranch, and Old Town (Anyon and LeBlanc 1984; Cosgrove and Cosgrove 1932; Creel 2006; Gilman and LeBlanc 2017; Shafer 2003). In contrast, the archaeological record of the area surrounding West Baker is relatively understudied, and archaeologists do not fully understand the identities and social experiences of West Baker's residents. Understanding people's social networks, trade relationships, and why they lived in edge regions away from core cultural areas has interested archaeologists in recent years (Bauer and Agbe-Davies 2010; Donnellan 2020; Harry and Herr 2018). Herr and Harry (2018) expect that people living in edge regions, like West Baker, would have been less subject to the social control of the core region (Mimbres Valley) and less able to participate in key identity-defining practices that occurred there. For example, Gilman (2018) uses architecture, painted pottery, and religious participation to discuss how Mimbres groups living in the San Simon region of southeast Arizona and the Upper Gila region northwest of the Mimbres Valley resisted or chose not to join in the same cultural traditions as those practiced in the Mimbres Valley heartland.

The purpose of this study is to evaluate how socially connected people at West Baker were to those living in the core Mimbres Valley and elsewhere in the United States Southwest and Mexican Northwest (SW/NW). Here, I argue that obsidian provenance data can be a measure to study the connectivity between people residing in edge and core areas. If people at West Baker and those in the Mimbres Valley used the same obsidian source(s), they were likely connected to the same obsidian social network and consistently interacted. On the other hand, if they used different obsidian sources, people at West Baker probably interacted less with those in the Mimbres Valley. First, I discuss what archaeologists know about obsidian procurement in the Mimbres Valley. I then present the energy-dispersive X-ray fluorescence (EDXRF) spectrometry results and discuss how connected or disconnected people at West Baker were to the core Mimbres Valley.

Obsidian Procurement in the Mimbres Valley

Obsidian is but one chipped stone raw material people in the SW/NW used to manufacture tools for hunting, warfare, and ceremony. Fortunately for researchers, this easily knappable, extremely sharp, volcanic glass is more amenable for provenance analysis than other chipped stone materials. Each obsidian source on the landscape has a unique geochemical fingerprint that researchers can determine using EDXRF spectrometry (Shackley 2011). After decades of fieldwork and laboratory analysis, Shackley (2005) has documented the geographic location of many of the primary and secondary obsidian deposits and the trace elemental composition of obsidian in New Mexico, Arizona, and parts of Sonora and Chihuahua (Figure 2). However, despite this work, Shackley sometimes analyzes obsidian artifacts that are geochemically distinct from other sources, but the geographic whereabouts of the obsidian source are unknown.

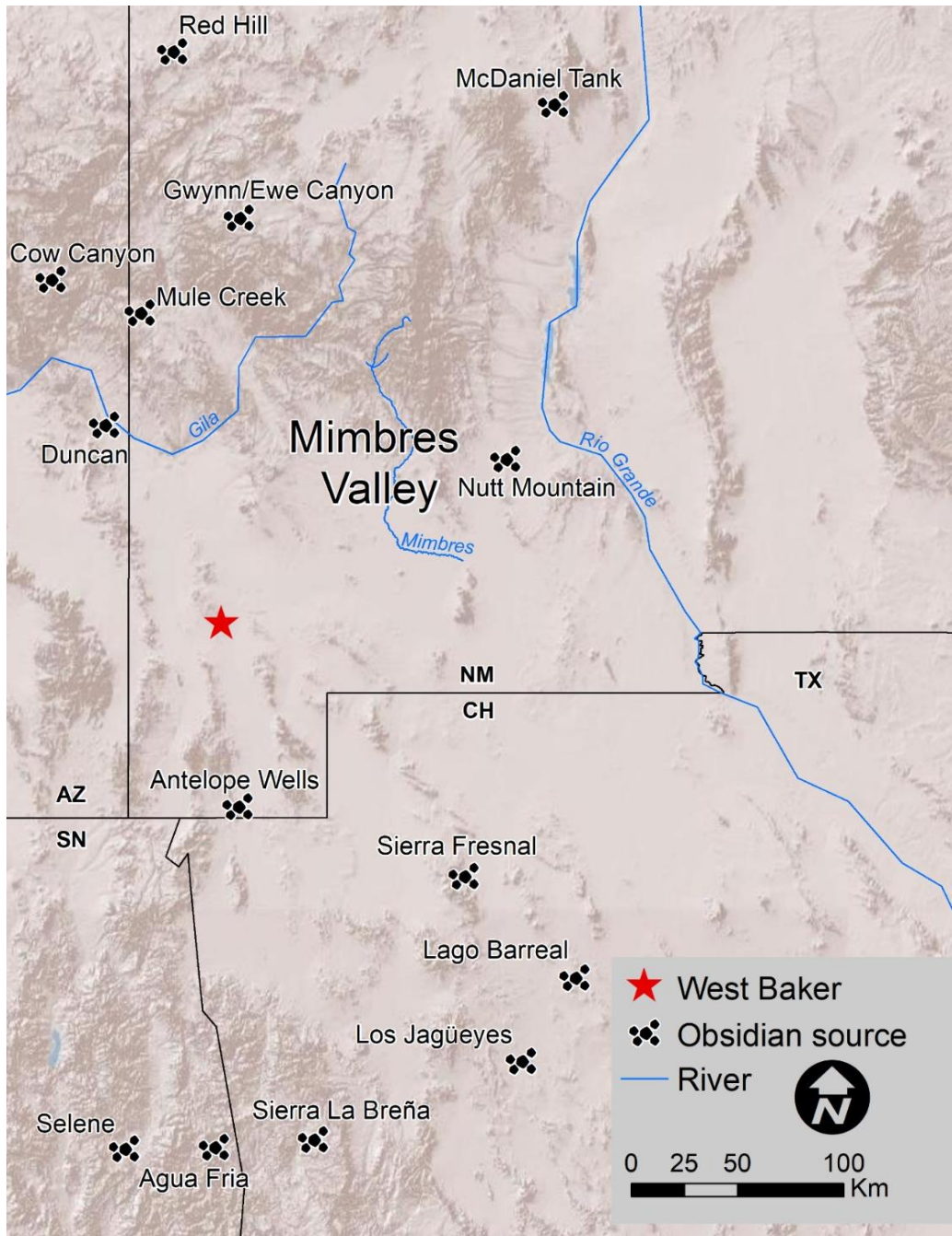


Figure 2. The known obsidian sources closest to West Baker.

Our knowledge of which obsidian sources people in the Mimbres Valley and elsewhere in southern New Mexico flaked into stone tools has increased in the past twenty years (Dolan 2016, 2019; Dolan et al. 2017a, 2019; Kenmotsu et al. 2014; Putsavage and Taliaferro 2018; Roth et al. 2019; Taliaferro 2004; Taliaferro et al. 2010; VanPool et al. 2013). Obsidian is relatively uncommon in most chipped stone assemblages in the Mimbres region, but lithic practitioners there often used obsidian to manufacture small arrow points (Taliaferro 2004). People in the Mimbres region were connected to two obsidian procurement networks (Taliaferro et al. 2010).

First, the Mule Creek network consisted of people primarily using Mule Creek obsidian with minor amounts of Cow Canyon, Gwynn/Ewe Canyon, and Red Hill obsidian. Second, the southern network consisted of people using Antelope Wells, Sierra Fresnal, and Los Jagüeyes obsidian. Mule Creek obsidian was still commonly used in the southern network, however.

Based on previous studies, people at Elk Ridge, Galaz, Swarts, and Old Town, overwhelmingly used the Antelope Creek variety of Mule Creek obsidian (Dolan 2019; Taliaferro et al. 2010). Because people in the Mimbres Valley during the Classic period were “somewhat inward focused and isolated” (Hegmon 2002:339; Hegmon et al. 1998), Dolan and Sedig (2023) make the argument that using Antelope Creek obsidian became a tradition even though other sources like Antelope Wells or Sierra Fresnal were closer in proximity. Much like it was socially acceptable only to use Mimbres black-on-white pottery, perhaps Antelope Creek obsidian may have been tied to people’s identity in the Mimbres Valley.

Like San Simon and Upper Gila Mimbres groups (Gilman 2018), West Baker’s residents may have been less subject to the social control of the core Mimbres Valley due to the geographic distance. Therefore, instead of using Mule Creek (Antelope Creek) obsidian, people at West Baker may have had stronger social ties with those associated with closer obsidian networks. Based on West Baker’s location, its residents likely coordinated more with the southern obsidian network and primarily used Antelope Wells obsidian since it was the closest and of equal material quality to Mule Creek. However, because one cannot tell the difference between obsidian sources based on visual characteristics alone (e.g., color, texture, and banding), analyzing the West Baker obsidian using EDXRF spectrometry is necessary.

Materials and Methods

The West Baker obsidian artifacts are curated at the Center for New Mexico Archaeology (CNMA) in Santa Fe, New Mexico. After receiving approval from CNMA to perform EDXRF analysis, I pulled the 39 obsidian artifacts McCluney collected. I then submitted the artifacts to Shackley for EDXRF analysis to determine which obsidian sources people at West Baker used. EDXRF spectrometry is an established and popular method to characterize the trace elemental composition of obsidian, and it is non-destructive to the artifact, requires little to no sample preparation, and is more cost-effective than other methods.

Shackley (2023) analyzed the West Baker obsidian artifacts using a laboratory benchtop ThermoScientific Quant’X EDXRF spectrometer at his Geoarchaeological XRF Laboratory in Albuquerque, New Mexico. He measured the trace elements Ti, Mn, Fe, Zn, Rb, Sr, Y, Zr, Nb, Ba, Pb, and Th, then converted them to concentration estimates presented in table form in parts per million. He then plotted Mn, Fe, Rb, Sr, Y, Zr, and Nb to discriminate individual source groups using plots to separate the sources visually. Shackley then compared the trace elemental values for each of the archaeological samples from West Baker with those from known baseline source samples reported in Shackley (2005).

EDXRF Results and Discussion

Results indicate that people at West Baker used six geochemically distinct obsidian sources (Table 1 and Figure 3). Most of the artifacts ($n = 28$) are from an as yet geographically unknown obsidian source that Shackley provisionally calls Pyramid Mountains Unknown. The remaining 11 artifacts derive from Mule Creek ($n = 5$), Antelope Wells ($n = 4$), Sierra Fresnal ($n = 1$), and Selene ($n = 1$). Four of the Mule Creek artifacts match the composition of Antelope Creek, and one matches the composition of North Sawmill Creek.

| Obsidian Source | Count | Overall Percent |
|----------------------------------|-------|-----------------|
| Pyramid Mountains Unknown | 28 | 71.8 |
| Antelope Wells | 4 | 10.3 |
| Mule Creek (Antelope Creek) | 4 | 10.3 |
| Mule Creek (North Sawmill Creek) | 1 | 2.6 |
| Sierra Fresnal | 1 | 2.6 |
| Selene | 1 | 2.6 |
| Total | 39 | 100 |

Table 1. West Baker Obsidian Provenance Results

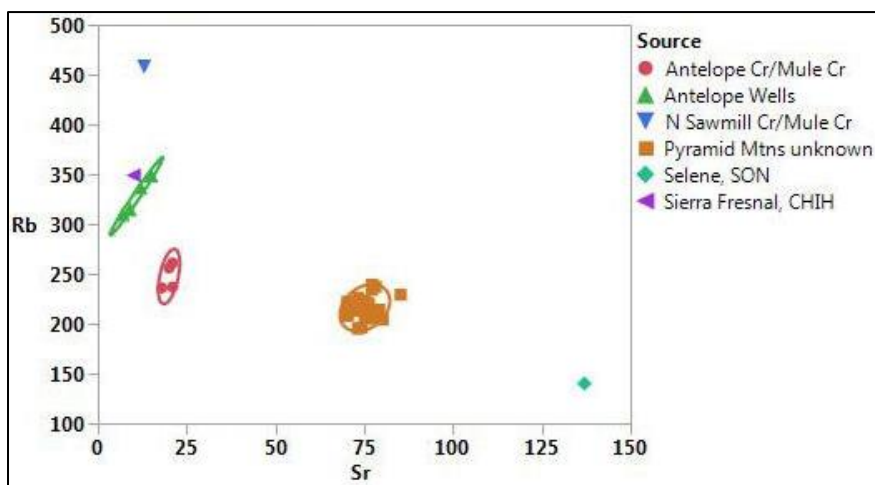


Figure 3. Sr/Rb bivariate plot of all West Baker obsidian artifacts analyzed. Confidence ellipses at 90%.

Shackley has never encountered Pyramid Mountains Unknown obsidian in the tens of thousands of obsidian artifacts from SW/NW archaeological contexts that he has analyzed with EDXRF spectrometry. Because Pyramid Mountains Unknown has never been seen in archaeological contexts in the region, and people at West Baker used it the most, there is a good possibility that the location of this obsidian source is somewhere in the Pyramid Mountains, relatively near the site. In addition to Pyramid Mountains Unknown, people at West Baker used Mule Creek (Antelope Creek and North Sawmill Creek), Antelope Wells, Sierra Fresnal, and Selene. As discussed earlier, people in the Mimbres Valley overwhelmingly used Antelope Creek obsidian for tool manufacture (Dolan 2019; Dolan and Sedig 2023; Roth et al. 2019; Taliaferro et al. 2010). However, people in the Mimbres Valley seldom used Antelope Wells, Sierra Fresnal, and

Selene obsidian. Instead, people further south who lived in the lower elevation basin and range near Deming and even further south in Sonora and Chihuahua preferred Antelope Wells, Sierra Fresnal, and Selene obsidian (Dolan et al. 2017b; Pailes 2016; Putsavage and Taliaferro 2018; VanPool et al. 2013).

Of the 39 obsidian artifacts available at CNMA, six are projectile points, and 33 are flakes. Interestingly, the three smallest obsidian arrow points recovered at West Baker are made from Pyramid Mountains Unknown material. However, the three largest are made from Antelope Creek material. Most likely, the Antelope Creek points came into West Baker through trade already finished because the EDXRF data demonstrates that only one flake derives from Antelope Creek.

Conclusions

Based on the West Baker obsidian provenance data, people living there used different sources than those in the Mimbres Valley. Instead of Antelope Creek obsidian, they overwhelmingly used the local Pyramid Mountains Unknown obsidian, and were connected to the southern obsidian network due to the presence of Antelope Wells, Sierra Fresnal, and Selene obsidian. Furthermore, the lack of Antelope Creek debitage and the presence of Antelope Creek projectile points indicate that some interaction occurred between the core Mimbres Valley and West Baker. Potentially, people at West Baker visited kin groups in the Mimbres Valley to participate in rituals and they brought back Antelope Creek obsidian projectile points.

This West Baker obsidian study has contributed to a body of anthropological and archaeological research by examining the connectivity of people in the past and how archaeologists can better study prehispanic social networks in edge and core areas using understudied research collections with non-destructive methods. Also, these EDXRF data have increased the sample size of sourced obsidian artifacts from Hidalgo County, an understudied area for Mimbres archaeology. This study has also provided evidence of a new obsidian source in southwest New Mexico that people used for small scale chipped stone manufacture. Additional work on the obsidian artifacts and chipped stone tools from West Baker is ongoing. Future research will integrate the obsidian provenance data, ceramic data, and other material culture studies to help us better understand how small scale agriculturists at West Baker connected to the social world around them.

Acknowledgments

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