



## Obsidian Sourcing

### Introduction



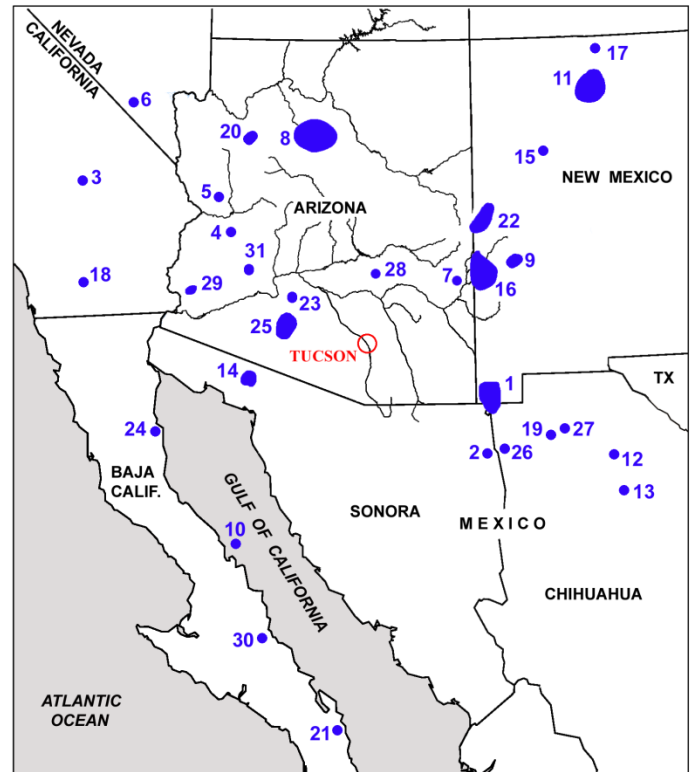
Obsidian, also referred to as volcanic glass, is a not uncommon material found on Native American archeological sites throughout the American southwest. From the paleolithic<sup>1</sup> through historic times obsidian has been sought after and traded by native peoples. Obsidian is an excellent material for flint knapping (the process of making stone tools), it is smooth, hard, easily worked,

predictable in its flaking characteristics, and produces a razor-sharp edge that can easily cut skin and flesh. Projectile points (arrow heads) and scrapers are the most common type of tool made from obsidian. Obsidian artifacts have been found on archeological sites in Saguaro National Park (SNP).

Through trace element analyses, the source or parent location of obsidian used to make chipped obsidian tools can be identified and subsequent research has shown that native peoples traded this valuable commodity many hundreds of miles from many volcanic source areas.

### Obsidian Sourcing

Obsidian sourcing refers to scientific research concerned with establishing chemical correlations between geologic parent materials (obsidian sources) and archaeological artifacts made from obsidian.<sup>2</sup> The obsidian at each source area has a unique assemblage of trace elements which allows identification of the source locality. This is because each time a volcano erupts the magma is composed of a distinct combination of minerals. Therefore the chemistry of obsidian varies from volcano to volcano, and this chemical “fingerprint” allows researchers to match an obsidian artifact to its volcanic origin. Over 30 obsidian source localities have been identified in the American southwest and northwest Mexico (Figure 1).



- |                             |                    |                     |
|-----------------------------|--------------------|---------------------|
| 1 Antelope Wells            | 11 Jemez           | 21 Punta Mangles    |
| 2 Aqua Fria                 | 12 Lago Barreal    | 22 Red Hill         |
| 3 Bristol Mts.              | 13 Los Jayueyes    | 23 Sand Tanks       |
| 4 Bull Creek                | 14 Los Vidrios     | 24 San Felipe       |
| 5 Burro Creek               | 15 Mt. Taylor      | 25 Saucedo Mts.     |
| 6 Cow Canyon                | 16 Mule Creek      | 26 Sierra la Brena  |
| 7 Devil Peak                | 17 No Agua Peak    | 27 Sierra Fresnal   |
| 8 Government Mtn.           | 18 Obsidian Butte  | 28 Superior         |
| 9 Gwynn Canyon              | 19 Ojo Fredrico    | 29 Tank Mts.        |
| 10 Isla Angel de la Guardia | 20 Partridge Creek | 30 Valle del Azufre |
|                             |                    | 31 Vulture          |

Figure 1. Map of the American southwest and northwest Mexico showing geological obsidian source locations.<sup>1</sup>

Obsidian sourcing also allows archaeologists to study source-use patterning in an obsidian assemblage at a site, or region, by artifact type and time period with the ultimate goal of investigating continuity and change in prehistoric trade/exchange relationships and group mobility patterns through time.<sup>2</sup>

[For examples of obsidian sourcing, see page 2.](#)

# Cultural Resource Brief

## Examples of Obsidian Sourcing

A number of obsidian artifacts and flakes have been collected from archeological sites in Saguaro National Park (SNP), but no attempt has been made to identify obsidian source localities for this material. There have been studies of archeological sites within the Tucson Basin outside of SNP that have identified obsidian sources. As can be seen from the examples in the table below, obsidian found in these Tucson Basin sites came from a wide variety of obsidian source localities.



Example of unmodified nodule of Government Mountain obsidian. Maximum length is 5".

<u>Archeological Site:</u>	<b>Sleeping Snake</b> AZ BB:9:104 [ASM] <sup>3</sup>	<b>Honey Bee Village</b> AZ BB:9:88 [ASM] <sup>3</sup>	<b>Marana Platform Mound Site</b> AZ AA:12:251 [ASM] <sup>4</sup>
<b>Obsidian Source</b>			
<b>Location* :</b>	Mule Creek Superior Sauceda Mountains	Cow Canyon Government Mountain Mule Creek Sauceda Mountains Superior Tank Mountain	Cow Canyon Mule Creek Sauceda Mountains Superior Vulture
* see Figure 1 for map showing obsidian source locations			

<sup>1</sup> Marcus J. Hamilton, Bruce B. Huckell, and M. Steven Shackley, Clovis Obsidian Sources in the Central Rio Grande Rift Region of New Mexico. *Archeology: North America*: 62-65  
<http://www.unm.edu/~marcusj/HamiltonetalCRP.pdf>

<sup>2</sup> <http://www.geochemicalresearch.com/about-source.html>

<sup>3</sup> Steven M. Shackley, *Source Provenance of Obsidian from the Honey Bee Village, AZ BB:9:88 (ASM), and Sleeping Snake, AZ BB:9:104 (ASM), Tucson Basin, Arizona*. 2012

<sup>4</sup> James M. Bayman, The Trade and Manufacture of Shell and Obsidian in Classic Hohokam Society. *Newsletter of the Center for Desert Archaeology*, Vol. 9, No. 1,

Bruce B. Huckell, V.T. Holliday, M. Hamilton, C. Sinkovec, C. Merriman, M.S. Shackley, and R.H. Weber, The Mockingbird Gap Clovis Site: 2007 Investigations. *Current Research in the Pleistocene* 25:95-97. 2008

<http://www.mindat.org/min-8519.html>

M. Steven Shackley, *Obsidian: Geology and Archaeology in the American Southwest*. University of Arizona Press, Tucson. 2005

Ulrich Henn and Claudio C. Milisenda, *Gemmological Tables* (2004)



Obsidian core. First step in making an obsidian tool is the reduction of the core. Using a hammer stone, individual flakes were struck from this core. Individual flakes can then be worked into tools. The core shown above has had many flakes removed as evidenced by what are known as flake scars.

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