Title
An Energy-Dispersive X-Ray Fluorescence Analysis of Obsidian Artifacts from Two Sites Near Nutt Mountain, Sierra County, New Mexico

Permalink
https://escholarship.org/uc/item/3ds5h4fc

Author
Shackley, M. Steven

Publication Date
2015-07-19

Supplemental Material
https://escholarship.org/uc/item/3ds5h4fc#supplemental

License
CC BY-NC 4.0
Dear John,

The analysis here of four obsidian artifacts from two sites near Nutt Mountain, southern New Mexico indicates local procurement of the ash flow deposit Nutt Mountain obsidian source nearby, and the Grants Ridge source from Mount Taylor, northern New Mexico, although the latter is available in Rio Grande Quaternary alluvium to the east of the sites (see Church 2000 and Shackley 2012, 2014; Table 1 and Figure 1 here). The Nutt Mountain source was relatively recently discovered by Tim Church and sampled, mapped, and analyzed by this laboratory in 1996, 2008, and 2013 (Shackley 2014). The Nutt Mountain marekanites are part of an ash flow sheet distributed over a large area east of the Nutt Mountain rhyolite neck. It is not clear, as yet, what the relationship is between Nutt Mountain and the obsidian, but they are both likely from the same magma source. Specific instrumental methods can be found at http://www.swxrflab.net/anlysis.htm, and Shackley (2005). Source assignment was made by comparison to source standard data in the laboratory. Analysis of the USGS RGM-1 standard indicates high machine precision for the elements of interest (Shackley 2011; Table 1 here).

Sincerely,

M. Steven Shackley, Ph.D.
Director

VOICE: 510-393-3931
INTERNET: shackley@berkeley.edu
http://www.swxrflab.net/
REFERENCES CITED


Table 1. Elemental concentrations for the archaeological samples and USGS RGM-1 obsidian standard. All measurements in parts per million (ppm).

<table>
<thead>
<tr>
<th>Site/Sample</th>
<th>Ti</th>
<th>Mn</th>
<th>Fe</th>
<th>Zn</th>
<th>Rb</th>
<th>Sr</th>
<th>Y</th>
<th>Zr</th>
<th>Nb</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>012-11-OB1</td>
<td>1113</td>
<td>477</td>
<td>1175</td>
<td>62</td>
<td>181</td>
<td>25</td>
<td>29</td>
<td>119</td>
<td>22</td>
<td>Nutt Mtn Rhy</td>
</tr>
<tr>
<td>012-11-OB2</td>
<td>705</td>
<td>462</td>
<td>1104</td>
<td>71</td>
<td>195</td>
<td>29</td>
<td>27</td>
<td>120</td>
<td>21</td>
<td>Nutt Mtn Rhy</td>
</tr>
<tr>
<td>012-15-OB1</td>
<td>866</td>
<td>490</td>
<td>1137</td>
<td>99</td>
<td>203</td>
<td>27</td>
<td>30</td>
<td>123</td>
<td>23</td>
<td>Nutt Mtn Rhy</td>
</tr>
<tr>
<td>012-15-OB</td>
<td>516</td>
<td>759</td>
<td>1162</td>
<td>200</td>
<td>567</td>
<td>12</td>
<td>79</td>
<td>115</td>
<td>192</td>
<td>Grants Ridge, Mt Taylor standard</td>
</tr>
</tbody>
</table>
| RGM1-S4     | 1530| 290 | 1375| 40  | 150 | 106 | 27  | 220 | 9            | www.escholarship.org/uc/item/3ds5h4fc
Figure 1. Zr versus Rb bivariate plot of the artifact and Nutt Mountain source data (from Shackley 2014).