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An Energy-Dispersive X-Ray Fluorescence Analysis of Obsidian Artifacts from Various Sites in Oklahoma

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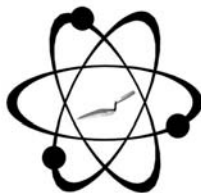
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GEOARCHAEOLOGICAL X-RAY FLUORESCENCE SPECTROMETRY LABORATORY

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LETTER REPORT

AN ENERGY-DISPERSIVE X-RAY FLUORESCENCE ANALYSIS OF OBSIDIAN ARTIFACTS FROM VARIOUS SITES IN OKLAHOMA

4 July 2014

Kristen Carlson
University of Oklahoma
Archaeological Survey
111 East Chesapeake Ave.
Norman, OK 73019

Dear Kristen:

As in the earlier study, some of the artifacts were produced from Malad, Idaho obsidian and most from one of three sources in the Jemez Mountains, northern New Mexico (El Rechuelos, Cerro Toledo Rhyolite, Valles Rhyolite), a rather typical pattern, particularly in early sites (Shackley 2014; Table 1 and Figure 1 here). 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 (see also Shackley 1995, 2005). Analysis of the USGS RGM-1 standard indicates high machine precision for the elements of interest (Table 1 here).

Sincerely,

M. Steven Shackley, Ph.D.
Director

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<http://www.swxrflab.net/>

REFERENCES CITED

Shackley, M.S.

1995 Sources of Archaeological Obsidian in the Greater American Southwest: An Update and Quantitative Analysis. *American Antiquity* 60(3):531-551.

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

2014 An Energy-Dispersive X-Ray Fluorescence Analysis of Obsidian Artifacts from Various Sites in Oklahoma. Report prepared for the Oklahoma Archaeological Survey, Norman.

Table 1. Elemental concentrations for the archaeological samples. All measurements in parts per million (ppm).

SITE/SAMPLE	Ti	Mn	Fe	Rb	Sr	Y	Zr	Nb	Ba	Pb	Th	SOURCE
34CI72												
13	806	364	8919	151	9	44	157	46	0	20	22	Valles Rhy (Cerro del Medio), NM
14	617	403	5386	147	6	24	69	44	0	27	19	El Rechuelos, NM
15	568	428	5495	161	2	25	67	45	53	24	24	El Rechuelos, NM
16	336	102	1802	0	5	3	13	4	0	6	4	not obsidian
17	661	407	8887	162	6	44	166	50	34	25	21	Valles Rhy (Cerro del Medio), NM
18	279	97	1564	0	10	4	9	2	88	4	4	not obsidian
19	560	439	5301	153	6	21	69	45	0	26	25	El Rechuelos, NM
34CI87												
1	682	453	9717	168	5	44	175	52	37	25	27	Valles Rhy (Cerro del Medio), NM
2	576	395	5150	144	3	26	68	38	43	25	17	El Rechuelos, NM
Sharp												
3	709	436	9690	160	6	47	169	53	20	25	22	Valles Rhy (Cerro del Medio), NM
4	580	394	8738	155	7	44	173	46	54	24	18	Valles Rhy (Cerro del Medio), NM
5	542	392	8915	161	5	44	162	50	0	26	21	Valles Rhy (Cerro del Medio), NM
6	898	253	8380	124	71	37	89	15	1875	28	27	Malad, ID
7	609	548	9922	205	2	63	179	91	0	36	27	Cerro Toledo Rhy, NM
8	596	371	8367	152	7	43	156	47	36	25	21	Valles Rhy (Cerro del Medio), NM

9	881	249	8056	128	72	35	88	17	1891	28	31	Malad, ID
10	669	383	9148	156	8	45	167	53	0	24	15	Valles Rhy (Cerro del Medio), NM
11	599	428	5448	152	7	27	71	43	0	25	26	El Rechuelos, NM
12	569	376	5066	151	5	25	71	46	6	24	26	El Rechuelos, NM
RGM1-S5	1531	293	12706	142	102	24	220	8	641	20	14	standard

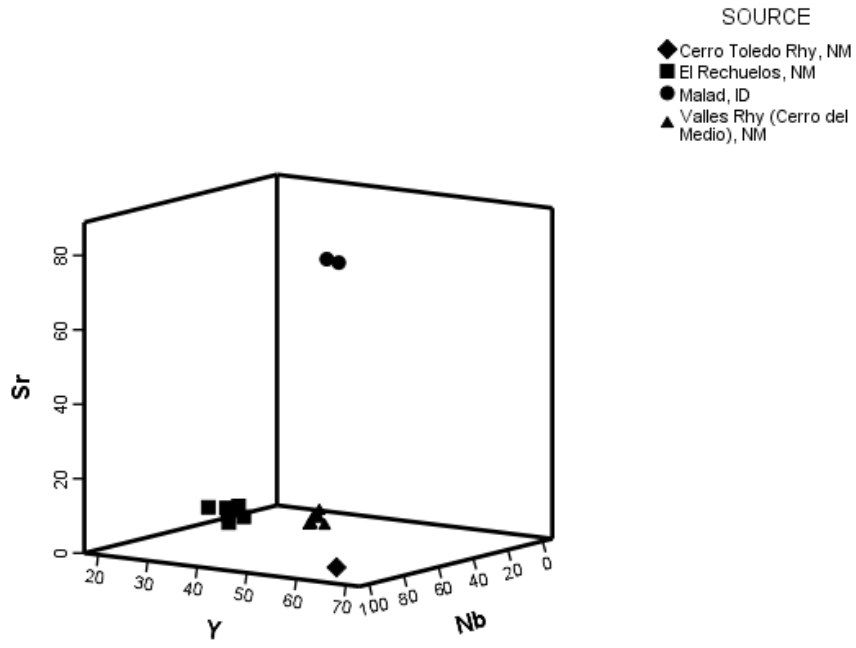


Figure 1. Y, Sr, Nb three-dimensional plot of the archaeological specimens.