Early and Middle Holocene Archaeology of the Northern Great Basin

Edited by

Dennis L. Jenkins
Thomas J. Connolly
C. Melvin Aikens

University of Oregon Anthropological Papers 62

Published by the Museum of Natural History and Department of Anthropology
University of Oregon, Eugene
2004

Table of Contents

X-Rays, Artifacts, and Procurement Ranges: A Mid-Project Snapshot of Prehistoric Obsidian Procurement Patterns in the Fort Rock Basin of Oregon

by Craig E. Skinner, Jennifer J. Thatcher, Dennis L. Jenkins, and Albert C. Oetting

Introduction

Without a doubt, the most ubiquitous and highly preferred type of lithic material found throughout the archaeological assemblages of the Fort Rock Basin is obsidian glass. The region is literally surrounded by numerous obsidian sources and these sources of natural glass were intensively utilized throughout the long span of human occupation in the basin. Despite the importance of obsidian in understanding and interpreting the archaeological record, however, until very recently little was known about either the sources of natural glass that were available or the patterns of prehistoric use of those sources.

Until less than a decade ago, the number of geochemically analyzed obsidian artifacts from archaeological sites in the Fort Rock Basin was very small. Prior to 1993, only two investigations had been undertaken–an intriguing but methodologically flawed project reported by Sappington and Toepel (1981) and a small study at the Fort Rock and Connley Caves described by Skinner (1983). In 1993, the final report for the Buffalo Flat Project was completed and the results of the first significant number of geochemically-analyzed artifacts from the Fort Rock Basin were reported (Hughes 1993; Oetting 1993). Interestingly, the results of this initial large-scale investigation revealed the presence of a significant number of unidentified obsidian sources among the analyzed artifacts.

There was clearly a need to investigate both the regional sources of obsidian and to increase the corpus of characterized artifacts available for analysis and interpretation. In 1995, the University of Oregon began to increasingly focus on identifying and understanding the prehistoric use of the sources and since then the pace of obsidian trace element provenance and hydration analysis studies has picked up dramatically. To date, more than 1,600 specimens from sites within or along the border of the Fort Rock Basin have been geochemically characterized. At the same time, in excess of 900 artifacts have been subjected to obsidian hydration analyses. Concurrently, Northwest Research Obsidian Laboratory began a systematic geochemical survey of obsidian sources in the potential Fort Rock Basin source regions of central and eastern Oregon, California, and Nevada. We have now completed the trace element analysis of several thousand geologic specimens from scores of different sources, including many of those found in or near the Fort Rock Basin region (Skinner 1999; Northwest Research Obsidian Studies Laboratory 2003a).

Prehistoric Obsidian Use Through Space and Time

The overall objectives we have developed to guide our obsidian artifact and source research to date are quite straightforward:

1. *To identify and geochemically characterize the natural sources of obsidian in and adjacent to the Fort Rock Basin.* In order to identify the sources of the obsidian artifacts, it is plain that we must first have found their geologic sources, a methodological step in artifact provenance studies that is often neglected in the rush for archaeological results. It is also critical that we understand and map the secondary distribution of source material in the basin. A variety of natural transport processes can distribute obsidian at considerable distances from primary source areas.

2. *To geochemically characterize significant numbers of artifacts from key archaeological sites in the basin.* When it comes to interpreting obsidian provenance data, size matters. A robust analysis of regional prehistoric obsidian use requires an adequate number of geographically

Early and Middle Holocene Archaeology of the Northern Great Basin
Edited by D. L. Jenkins, T. J. Connolly, and C. M. Aikens, pp. 221-232,
University of Oregon Anthropological Papers 62, 2004

dispersed archaeological sites and a significant number of characterized artifacts. This is particularly true in an area such as the Fort Rock Basin in which many different sources of glass were utilized.

3. *To describe the geographic and spatial distribution of the characterized obsidian artifacts.* What are the measurable attributes of the Fort Rock Basin prehistoric obsidian procurement systems and what do they say about prehistoric behavior? Were some sources preferentially used and why? What was the procurement range of the prehistoric inhabitants of the basin? How do the patterns of obsidian use reflect movement, interaction, and contact both within the Fort Rock Basin and between adjacent or nearby lake basins and geographic areas?

4. *To explore the temporal patterns of prehistoric source use with temporally-sensitive artifact types, obsidian hydration measurements, tephrochronologic clues, and radiocarbon dates.* How did patterns of prehistoric source use change over time, and what cultural processes or environmental influences might have been responsible for these changes?

For the geochemical characterization analysis of both sources and artifacts, our preferred method has been energy-dispersive X-ray fluorescence (EDXRF) analysis. This method is nondestructive, rapid and accurate, relatively inexpensive, and perhaps most importantly, is easily accessible to us (Northwest Research Obsidian Studies Laboratory 2003a). In addition, geographic information systems (using ArcView) techniques are used to map and examine the geographic patterning of the prehistoric obsidian use that is revealed by these geochemical investigations.

In the research that is summarized here, we discuss the current state of obsidian source studies and artifact provenance and hydration research in the Fort Rock Basin. We also offer some preliminary observations that are beginning to emerge from the data about the patterns of prehistoric use, particularly those related to overall procurement ranges and directionality. However, we would like to emphasize that the data reviewed here are only a snapshot in time of a long-term project that is still actively in progress – our database of source and artifact information is rapidly expanding and we have scarcely begun with our analyses and interpretations.

Obsidian Sources in the Fort Rock Basin Region

Many different sources of obsidian have been identified within the Fort Rock Basin and in the region bordering the basin (Ambroz 1997; Hughes 1986; Northwest Research Obsidian Studies Laboratory 2003b; Sappington 1981a, 1981b; Skinner 1983, 1999; see Figure 2). Three of these – Cougar Mountain, Silver Lake/Sycan Marsh, and Hager Mountain – are found in archaeologically significant quantities within the boundaries of the old pluvial lake shoreline and were locally available in large quantities. We were somewhat surprised, then, when initial EDXRF studies of artifacts from several Fort Rock Basin sites indicated the presence of numerous additional sources that showed up as unknowns among the characterized artifacts (Skinner et al. 1995). Slightly earlier trace element investigations of artifacts associated with the Buffalo Flat Project (Skinner et al. 1995; Oetting 1993) had also pointed to the existence of many different unknown obsidian sources in the region. Because of this, a systematic search for new regional sources of obsidian was initiated and is currently underway. A concurrent study of the Silver Lake/Sycan Marsh source, one of the two most commonly utilized sources in the basin, has also been recently completed by Thatcher (2001). As obsidian source research has progressed in recent years, we have identified many of the formerly unknown obsidian sources. Several, such as Yreka Butte and Brooks Canyon, have been found in the region immediately adjacent to the basin. Others such as the multiple geochemical varieties found in association with the Glass Buttes Source Complex (Ambroz et al. 2001; Northwest Research Obsidian Studies Laboratory 2003b) have been identified from somewhat more distant areas.

Geochemically characterized nodules from the three locally available sources have been found at numerous primary (for Cougar Mountain) and secondary (Hager Mountain and Silver Lake/Sycan Marsh) localities throughout the basin. Rounded pebbles of obsidian from these sources can be found in many of the shoreline deposits in the basin (mapped by Forbes [1973] and Freidel [1993]). Nodules of glass have been reported from archaeological contexts in the Paulina Marsh-Silver Lake Subbasin (Jenkins 1994c; Jenkins and Aikens 1994; Thatcher 2001), in lake deposits in the Cougar Mountain vicinity (Forbes 1973; Allison 1979; Skinner 1983), and in lapilli-tuff deposits near Cougar Mountain at Table Mountain (Heiken 1972). Obsidian pebbles collected from a borrow pit excavated in a large gravel bar situated immediately southeast of Cougar Mountain was chemically characterized and, not surprisingly, proved to originate from the nearby Cougar Mountain source (Northwest Research Obsidian Studies Laboratory, unpublished research). In addition, small pebbles of obsidian that were too small for tool manufacture are found in the vicinity of the Bergen Site (35-LK-3175). These were analyzed and correlated with the Quartz Mountain source located not far north of the Fort Rock Basin.

Details concerning the many obsidian sources that are found represented among the characterized artifacts from Fort Rock Basin sites are beyond the scope of this current discussion. Ongoing research and references about the geology, geochemistry, and prehistoric use of the obsidian sources that are identified among Fort Rock Basin artifacts can be found on the World Wide Web (Northwest Research Obsidian Studies Laboratory 2003a, 2003b).

Results of XRF Trace Element Studies of Obsidian Artifacts

In this section, we summarize the results of the trace element analysis of 1,674 obsidian artifacts recovered from 29 archaeological sites located in the Fort Rock Basin (Figure 1, Table 1). The vast majority of the artifacts were analyzed by Geochemical Research Laboratory (N=473) and Northwest Research Obsidian Studies Laboratory (N=1,195) using EDXRF nondestructive methods. An additional six specimens were destructively analyzed with a wavelength-dispersive X-ray fluorescence spectrometer formerly operating at the University of Oregon (Skinner 1983). We did not attempt to include the earlier XRF analyses reported by Sappington and Toepel (1981). Their significant but problematic early study used a very

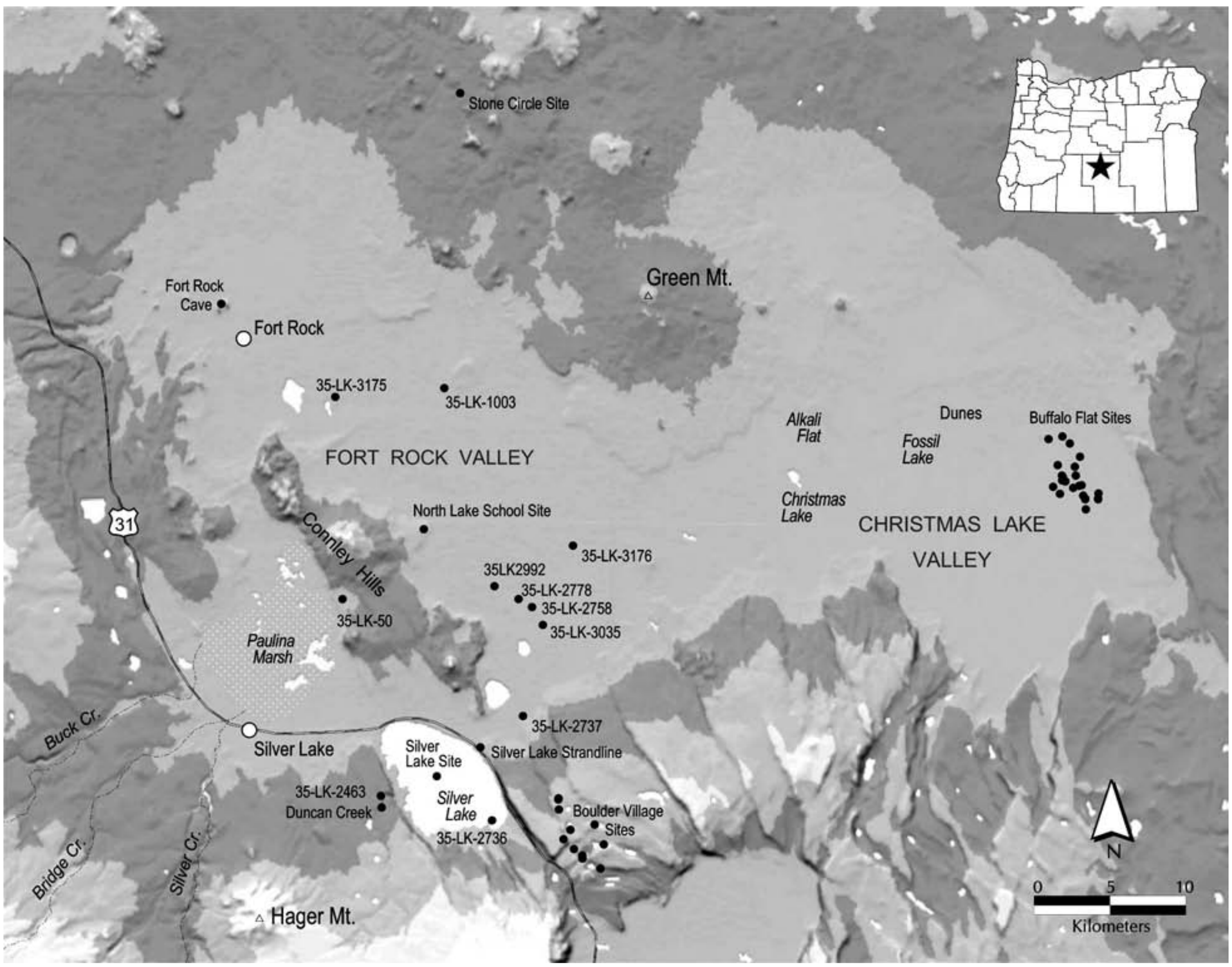


Figure 1. Shaded relief map showing Fort Rock Basin archaeological sites at which obsidian characterization and hydration studies have been undertaken.

Table 1. Summary of obsidian provenance and obsidian hydration-related archaeological projects in the Fort Rock Basin; additional information about many of these sites can be found in Aikens and Jenkins (1994a).

Site Name	Trinomial	XRF N=	OH N=[1]	Sub-Basin[2]	Reference(s)[3]
Bergen Site	35LK3175	137	66	FR	NWR 1998-91, 1999-06, 1999-71; Helzer 2001
Big M	35LK2737	15	14	SL	Jenkins 1994c; NWR 2001-23
Boulder Village	35LK2846	103	57	SL (BV)	NWR 1998-35; O'Grady 1999
Bowling Dune	35LK2992	23	–	FR	Hughes 1995
Buffalo Flat	Several Sites	423	362	CL	Hughes 1993; Oetting 1993; Jones et al. 2003
Carlon Village	35LK2736	170	117	SL	NWR 1997-82, 1998-90, 1998-95; Wingard 1999, 2001
Claim A1	35LK3176	6	4	FR	NWR 1999-06
Connley Caves	35LK50	354	163	SL	Sappington and Toepel 1981; Skinner 1983; NWR 2001-23, 2001-62; Thatcher 2001
DJ Ranch	35LK2758	30	3	FR	Hughes 1995
Duncan Creek	NA	5	–	SL	NWR 1998-71; O'Grady 1999
Fort Rock Cave	35LK1	1	–	FR	Sappington and Toepel 1981; Skinner 1983
GP-2	35LK2778	23	7	FR	NWR 1995-53
Locality III	35LK3035	133	65	FR	NWR 1995-53, 1996-29
North Lake School	1136_NLS_1	1	1	FR	NWR 1999-06
Playa 9	35LK2909	14	–	SL (BV)	NWR 1998-71; O'Grady 1999
Ratz Nest	35LK2463	14	–	SL	NWR 1998-71; O'Grady 1999
Sage	35LK1003	1	1	FR	NWR 1995-53
Scott's Village	35LK2844	32	–	SL	NWR 1998-71; O'Grady 1999
Silver Lake	NA	50	50	SL	NWR 1998-81; Wingard 1999
Silver Lake N. Shore	NA	15	–	SL	NWR 65-464
Stone Circle Site	NA	75	–	FR	NWR 1999-58, 2002-52; Unpub. Research (UOXRF Lab)
Teri's House	35LK2833	6	–	SL (BV)	NWR 1998-71; O'Grady 1999
7 PC	35LK2837	3	–	SL (BV)	NWR 1998-35; O'Grady 1999
8 USA	35LK2834	11	–	SL (BV)	NWR 1998-35, 1998-71; O'Grady 1999
10 US	35LK2831/32	18	–	SL (BV)	NWR 1998-71; O'Grady 1999
13 DJ	NA	3	–	SL (BV)	NWR 1998-35; O'Grady 1999
14 DJ	NA	3	–	SL (BV)	NWR 1998-35; O'Grady 1999
14 GP1	NA	4	–	SL (BV)	NWR 1998-35; O'Grady 1999
14 GP2	NA	1	–	SL (BV)	NWR 1998-35; O'Grady 1999
Total		1,674	910		

[1]Number of artifacts with measurable hydration rims.
[2]CL = Christmas Lake; FR = Fort Rock; SL = Silver Lake; BV = Boulder Village Complex.
[3]NWR = Northwest Research Obsidian Studies Laboratory Project number.

limited number of geologic sources for comparison and did not report the trace element composition of analyzed artifacts in comparable parts per million units. Because of this, we were unable to integrate the results of their analyses of 283 specimens into our research database.

Details about specific analytical methods and procedures used for the EDXRF analysis of most of the artifacts, and the measurement of hydration rims, are available at the Northwest Research Obsidian Studies Laboratory web site at *www.obsidianlab.com*. Also available in the research section of the website are the detailed results of the trace element analysis of all artifacts discussed here. In the initial stages of the analysis of obsidian artifacts from Fort Rock Basin sites, numerous unknown sources were noted among the characterized artifacts. Since that time, our knowledge of the occurrence and geochemistry of regional obsidian sources has grown significantly. Because of this, we reviewed and updated all source assignments in our XRF data set, resolving many of the different unknowns in the process. Although published in 1993 as an appendix to the Buffalo Flat report (Hughes 1993; Oetting 1993), the trace element work for these sites was carried out in two phases in 1989 and 1993. Several of the unknown sources noted in 1989 (then comprising 29% of the total) had been subsequently characterized by Hughes in the intervening years but the source assignments of the earlier XRF analyses had not been updated. Our first step in approaching this data set was to bring the earlier 1989 XRF results up to date so that they were consistent with the new sources identified in the later 1993 analyses by Hughes. We then compared the combined results of the Buffalo Flat data set with the Northwest Research Obsidian Studies Laboratory source reference data base and updated and integrated as much of Hughes' XRF data as possible into our current data base. During this process, we were able to identify many of the previously unknown sources, eventually reducing the number of unknown obsidian sources to about seven percent of the total. A summary of the results of the trace element analysis of all Fort Rock Basin artifacts is presented in Table 2. The locations of the identified sources are shown in Figure 2.

The sheer number of different geochemical sources of obsidian identified among the 1,674 characterized Fort Rock Basin artifacts–46 different known sources plus several as yet unidentified sources–is exceptional. A large proportion of the analyzed artifacts are formed tools, a sampling bias which undoubtedly elevated the level of overall source diversity. Formed tools are more likely to be curated (carried from place to place and reused) and often disproportionately originate from more distant sources than debitage or expedient tools. The significance of this bias to the current study is that

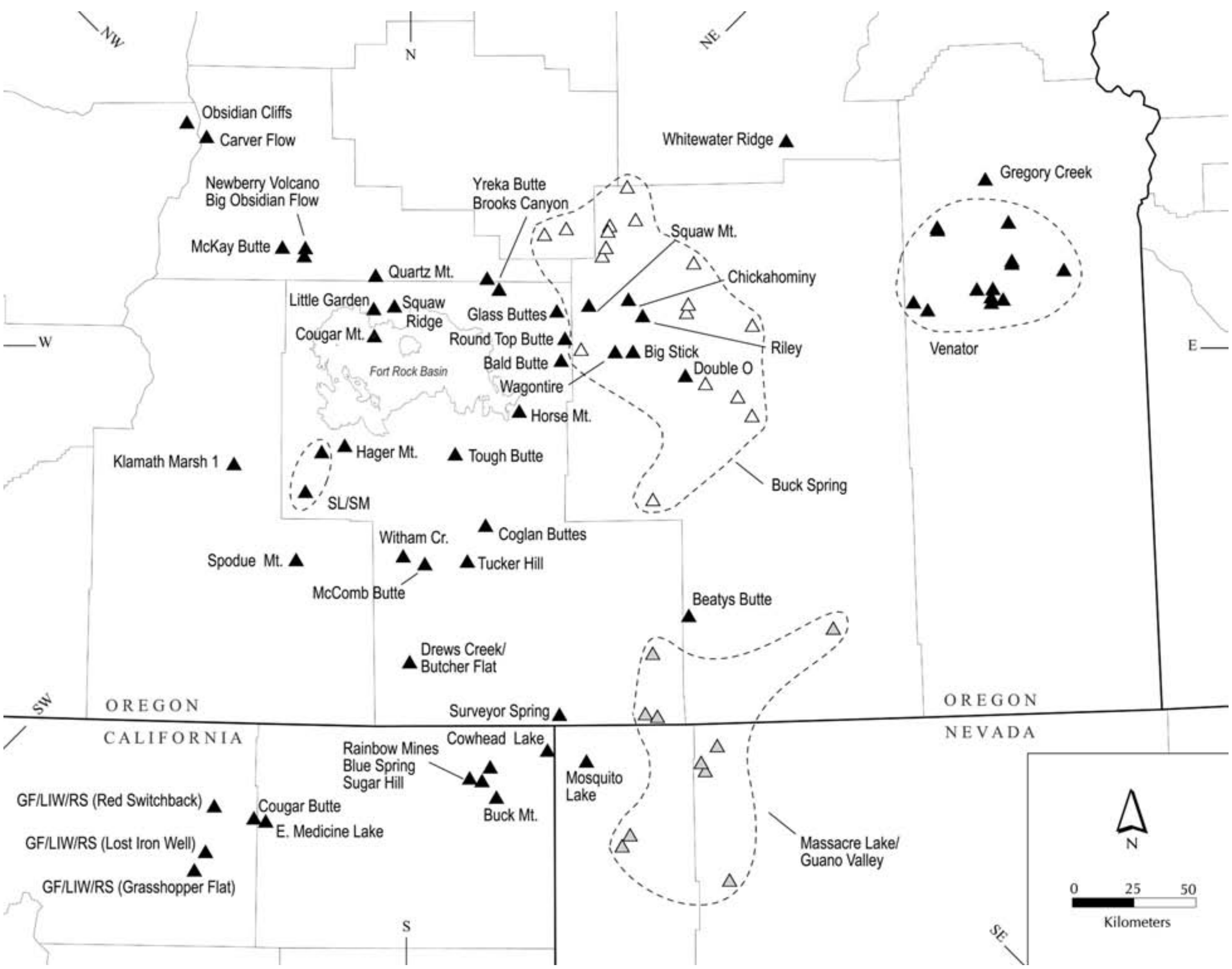


Figure 2. Trace element provenance studies of artifacts from Fort Rock Basin archaeological sites.

Table 2. Subbasin summary of results of trace element provenance studies on artifacts from Fort Rock Basin sites. Figures 3A through 3D are based on these data, also see the research section of *www.obsidianlab.com*.

Obsidian Sources	Fort Rock N=	Fort Rock %	Silver Lake N=	Silver Lake %	Christmas Valley N=	Christmas Valley %	Total N=	Total %
Local Obsidian Sources								
Cougar Mountain	131	30.5	174	21.2	28	6.6	333	19.9
Hager Mountain	9	2.1	30	3.7	1	0.2	40	2.4
Silver Lake/Sycan Marsh	55	12.8	156	19.0	55	13.0	266	15.9
Oregon Obsidian Sources								
Bald Butte	13	3.0	66	8.0	19	4.5	98	5.9
Glass Buttes Complex	15	3.5	43	5.2	102	24.1	160	9.6
Newberry Caldera[1]	5	1.2	7	0.9	4	0.9	16	1.0
Quartz Mountain	64	14.9	30	3.7	9	2.1	103	6.2
Spodue Mountain	32	7.4	53	6.5	31	7.3	116	6.9
Other Oregon Sources	59	13.7	129	15.7	144	34.0	331	19.8
Variety 5	6	1.4	79	9.6	10	2.4	95	5.7
Unknown	4	7.9	21	2.6	20	4.7	75	4.5
Northern California and Nevada Sources								
Medicine Lake[2]	2	0.5	4	0.5	–	–	6	0.4
Warner Mountains Area[3]	5	1.2	28	3.4	–	–	33	2.0
Mosquito Lake	–	–	1	0.1	–	–	1	0.1
Total	430	100.1	821	100.1	423	99.8	1,674	100.3

[1]Newberry Caldera = Combined Newberry Volcano and Big Obsidian Flow geochemical sources.
[2]Warner Mountains Area = Blue Spring, Buck Mountain, Cowhead Lake, Rainbow Mines, Sugar Hill sources.
[3]Medicine Lake = Cougar Butte, GF/LIW/RS, and East Medicine Lake sources.

interaction with other regions should be well represented in the sample.

Almost 38% of the artifacts originated from the three sources that are available within the boundaries of the Fort Rock Basin–Cougar Mountain, Hager Mountain, and Silver Lake/Sycan Marsh (see Table 2). Nodules of glass are available at many locations in the Fort Rock Valley Subbasin (Cougar Mountain glass) and Silver Lake Subbasin (Hager Mountain and Silver Lake/Sycan Marsh obsidian). However, obsidian from the Hager Mountain source tends to be smaller in size and of somewhat poorer quality and is found less often in artifact collections than the other local sources.

Sources from areas immediately adjacent to the Fort Rock Basin make up by far the largest proportion of the characterized artifacts from nonlocal sources. The more significant of these sources (N>10 artifacts) include Quartz Mountain, Yreka Butte, Brooks Canyon, Glass Buttes, Big Stick, Bald Butte, Horse Mountain, Coglan Buttes, Tucker Hill, and Spodue Mountain.

A small proportion of the artifacts (less than one percent) were correlated with northeastern California sources located at Medicine Lake Volcano and the Warner Mountains and with sources found in northwestern Nevada. The remainder of the identified sources are located in Oregon in the High Cascades (Obsidian Cliffs and Carver Flow), the Klamath Lake Basin (Spodue Mountain, Klamath Marsh 1, Newberry Volcano (Big Obsidian Flow, Newberry Volcano, McKay Butte), the High Lava Plains, and a scattering of other southeast Oregon sources. The most distant sources in Oregon and Nevada that were identified were Obsidian Cliffs and the Carver Flow in the High Cascades (N=5), Whitewater Ridge (N=4), Venator (N=1), Gregory Creek (N=2), Beatys Butte (N=14), Massacre Lake/Guano Valley (N=6), Surveyor Spring (N=2), and Mosquito Lake (N=1).

The massive pre- and post-Mazama obsidian sources available within nearby Newberry Caldera (Newberry Volcano and Big Obsidian Flow chemical sources; see MacLeod et al. 1995) accounted for only 16 of the 1,674 characterized artifacts. In contrast, nearly as many artifacts (N=14) correlated with the Beatys Butte source located at a considerable distance to the southeast in the Catlow Basin. This came as something of a surprise. Based on early trace element studies and the abundance of obsidian and water in the caldera, the senior author once suggested that "there was noticeable traffic between the [Fort Rock] valley and Newberry Caldera . . ." (Skinner 1983:Appendix IX-15). However, the evidence from trace element studies of obsidian found at sites in the Fort Rock Basin now suggests rather limited direct movement or interaction between the Basin and Newberry Caldera. Similarly, only a small proportion of characterized artifacts from Newberry Caldera sites have proven to originate from Fort Rock Basin sources (Hughes 1999).

Prehistoric Use of Obsidian in the Fort Rock Basin

Provenance Studies and Procurement Ranges

From small scale (household and site) to large scale (regional and interregional) levels of analysis, the spatial patterning of characterized obsidian artifacts is influenced by many cultural, environmental, sampling and analysis variables. The analysis and interpretation of spatial patterns of source use can provide critical information about the behavioral and environmental toolstone procurement variables that account for the observed distribution of the characterized artifacts.

At the site level of analysis, patterns of source use may be used to identify the presence of specific activity areas or even single tool manufacturing events. In special cases, patterns of source use may indicate differential access of goods and the existence of non-egalitarian social structures (Rice 1987).

At the intersite or regional level of investigation, the geographic patterning of characterized artifacts may provide information about seasonal procurement ranges, acquisition strategies, territorial or ethnic boundaries, the locations of prehistoric trails and travel routes, the curation value of particular sources or formal artifact types, cultural preferences regarding glass quality and color, the presence of trade and exchange systems, the existence of intergroup interaction, and the exchange of prestige items between elites of different groups (Hughes 1978, 1990; Binford 1979; Ericson 1981; Skinner 1983, 1995b; Hughes and Bettinger 1984, Bamforth 1986; Peterson et al. 1997; Dillian 2002).

In addition, the effects of environmental influences such as the geographic distribution of obsidian sources, the distance to the sources, the relative location of alternative or competing sources of lithic materials, raw material quality and abundance, toolstone size, the distribution of raw materials in secondary deposits, or the presence of potential barriers such as bodies of water or mountain ranges, must all be considered (Renfrew 1977; Skinner 1983; Beck and Jones 1990; Andrefsky 1994; Jones et al. 2003). Of particular importance can be the precision of our knowledge of obsidian source boundaries. Obsidian associated with fluvial or pluvial systems or ash-flow tuffs may be widely distributed over large geographic areas and it is critical to be able to distinguish between long distance procurement of a source and local procurement of a widely-distributed secondary source outcrop (Reid 1997).

Bias may be introduced during sampling by certain recovery methods, minimum physical sizes of analyzed artifacts, uneven geographic distribution of sites, and the use of small numbers of samples (Eerkens et al. 2002). Lastly, the tools used to analyze the spatial data (e.g., trend surface modeling algorithms) may affect the interpretation of the geographic patterns of obsidian use.

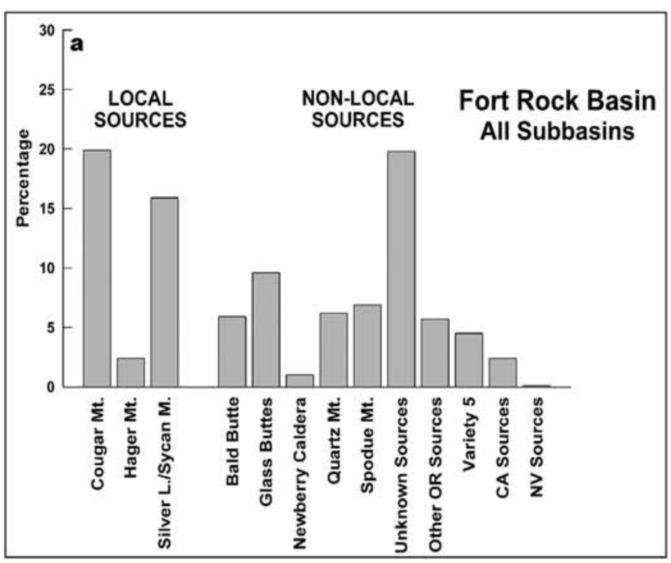
In the current investigation, we make the working assumption that the obsidian sources found at a given site or area in the Fort Rock Basin provide what is essentially a *map of the prehistoric territory or range that was used by the prehistoric inhabitants of the basin*. The processes involved in the cultural distribution of raw material from its geologic source may be simple or complex–trade and exchange, residential, logistical, or territorial mobility, or direct procurement, perhaps involving long distances. The activities that led to the archaeological distribution of obsidian over a landscape may be poorly known or even unknowable, but provenance studies provide us with a relatively clear map of the procurement territory that was involved. This range is known by a number of different terms including "procurement range," "procurement sphere," "procurement system," "subsistence range," and "foraging territory" (Shackley 1990, 1996; Kelly 1992; Roth 2000; Jones et al. 2003). All are relatively synonymous. These terms are also approximately equivalent to the concept of "interactional sphere" (Struever and Houart 1972) or "exchange network" (Plog 1977) with the important distinction that the presence of trade and exchange relationships is not implicitly implied.

Although trade and exchange are often invoked as explanations of the processes responsible for the long-distance procurement of nonlocal raw materials, long-distance direct access or embedded collection of materials over long distances are well documented and are probably a more common means of material acquisition (Myer 1928; Heizer 1942; Layton 1981; Kelly 1983; Goodyear 1989; Meltzer 1989; Carlson 1994; Malville 2001). As Meighan (1992:2) succinctly points out: "Recognition of 'alien' obsidian is not necessary discovery of an 'exchange system' . . . . Other evidence has to be brought forward before an 'exchange system' can be postulated, and in most of the papers utilizing this somewhat jargonistic term, the 'exchange system' is assumed rather than documented." In practice, the archaeological traces left by exchange and by direct procurement are usually identical and attempts to distinguish among the two processes are most often speculative or futile (Goodyear 1989; Meltzer 1989). Forays may be occasionally made to gather very specific resources (see Titiev 1937, and Fowler 1989, for examples) but it seems likely that in most areas the bulk of lithic resource procurement was embedded in routine seasonal food and resource-gathering activities (Goodyear 1989; Walsh 1998; Daniel 2001). The procurement range documented by the distribution of characterized obsidian artifacts, then, is probably very similar to the one that was utilized for other activities.

Once adequate data are available (as they are for the Fort Rock Basin), specific attributes and characteristics of these ranges or systems can be described and quantified. Following the initial suggestions of Plog (1977), these include content (in this case, obsidian), diversity of sources (or other items included in the procurement system), magnitude, size, boundaries, directionality, shape, symmetry, and temporal characteristics and duration, all determinable characteristics that reflect prehistoric behavior. In this early look at the prehistoric procurement characteristics of the Fort Rock Basin inhabitants, we focus specifically on the **source diversity, procurement range size and boundaries, and directionality**. We examine the patterns that are evident for the three major subbasins–Fort Rock, Silver Lake (and Paulina Marsh), and Christmas Valley (Hampton 1964; Freidel 1993, 1994).

Source Diversity

Although the specific artifact sources that were identified in each subbasin are very similar, the relative



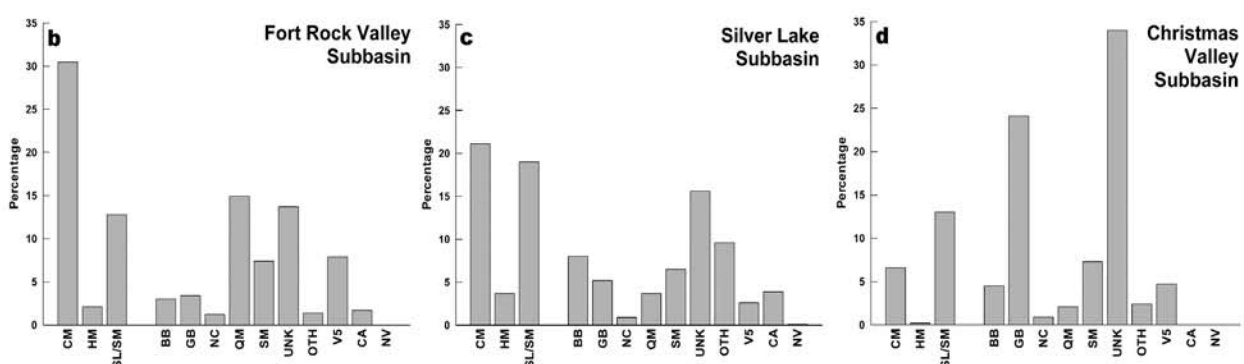


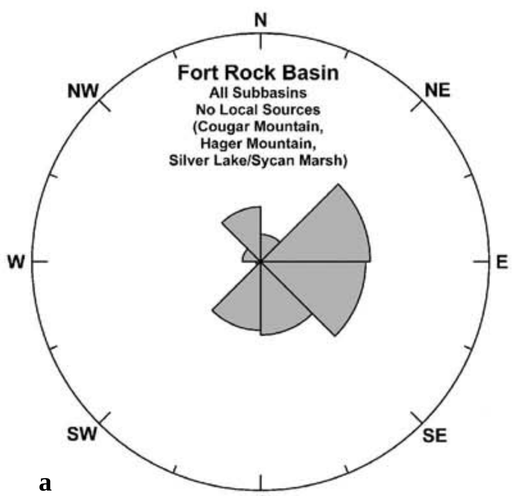
Figure 3. a. Histogram of all Fort Rock Basin artifact sources;
b. Fort Rock subbasin artifact sources;
c. Silver Lake subbasin artifact sources;
d. Christmas Valley subbasin artifact sources.

proportions of obsidian vary considerably (Figure 3). Obsidian from the local sources (Cougar Mountain, Hager Mountain, and Silver Lake/Sycan Marsh) makes up approximately 38 percent of the basin-wide total but varies substantially among the subbasins. For instance, the Cougar Mountain source occurs in considerably larger frequencies in the Fort Rock Valley Subbasin, almost certainly due to the proximity of obsidian from that source that is widely available in primary and secondary deposits. Similarly, the largest percentage of Silver Lake/Sycan Marsh and Hager Mountain obsidian artifacts are found in the Silver Lake Subbasin that lays adjacent to those two sources. In the Christmas Valley Subbasin, the most commonly used known obsidian sources are those found in association with the Glass Buttes Source Complex situated northeast of the basin.

The number of unknown sources is greatest in the Christmas Valley Subbasin. However, it is likely that this is due at least in part to the data set that was used for the analysis and not solely to the presence of unknown sources in the region surrounding this basin. All of the characterized Christmas Valley artifacts are associated with the Buffalo Flat Project whose artifacts were analyzed by Geochemical Research. Due to inter-laboratory differences in the reporting of trace elements, we were unable to thoroughly reassign known sources to all of the previously analyzed artifacts, leading to a larger number of unassigned artifacts in this basin.

Directionality of Source Use

The directionality of nonlocal source use is strongly linked to the direction and distance of the sources in relation to the different subbasins (Figure 4). In the Fort Rock Valley Subbasin, in the northwestern portion of the Fort Rock Basin, the largest number of nonlocal artifacts comes from the massive Quartz Mountain source that is located a short distance northwest from the basin. To the south, in the Silver Lake Subbasin, directionality of source use shifts dramatically to those sources south and southeast of this subbasin. Farther east, source use in the Christmas Valley again is quite different from the other subbasins and is dominated by northeastern sources.



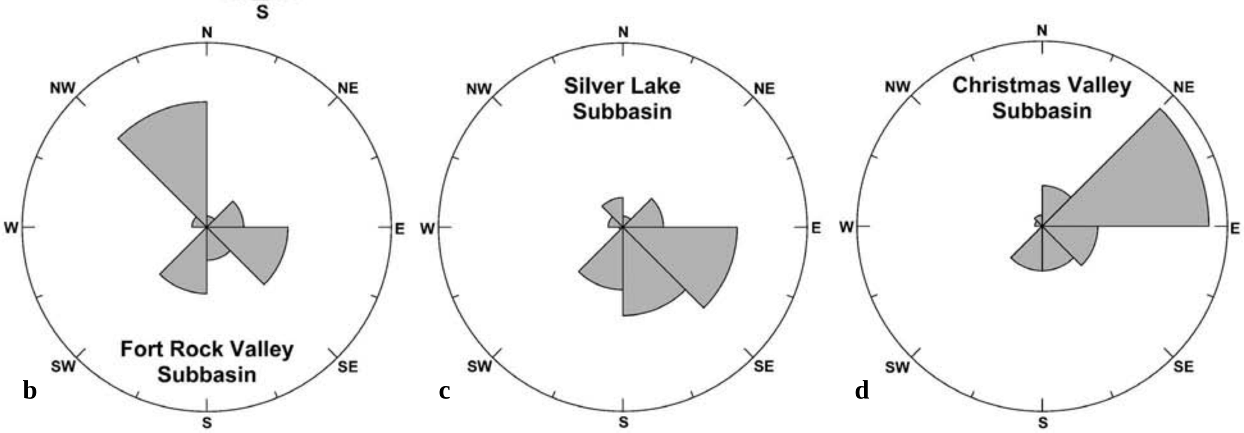


Figure 4. a. Rose diagram for all Fort Rock Lake Basin artifacts;
b. Rose diagram for Fort Rock subbasin artifacts;
c. Rose diagram for Silver Lake subbasin artifacts;
d. Rose diagram for Christmas Valley subbasin artifacts.

It is also likely that the directionality of source use is influenced by procurement ranges that varied over time, the result of environmental change, shifting contact and exchange relationships, or changes in population movements or density. In a study of temporally-sensitive characterized artifacts from the Drews Valley area (located in Oregon to the south of the Fort Rock Basin), Connolly and Jenkins (1997) observe that the directionality of source use changed over time, perhaps the result of shifting settlement patterns.

In all cases, the directionality of nonlocal source use appears to be strongly and straightforwardly influenced by the direction and distance to nearby sources of high-quality obsidian glass. Given that the Fort Rock Basin is nearly surrounded by these sources, there seems to have been little incentive to intensively exploit those sources that lay elsewhere.

Prehistoric Procurement Range

The prehistoric procurement range may be inferred from examining the geographic distribution of obsidian sources that were utilized in the Fort Rock Basin (Figure 5). The identified obsidian sources are widely scattered throughout the entire southcentral and southeast portion of Oregon, northeast California, and northwest Nevada. However, the vast majority of these sources are found in southcentral Oregon and it is evident that the most significant part of the Fort Rock Basin procurement range is focused in the region immediately surrounding the basin and in particular, in the areas to the south and east. If we assume that the procurement of obsidian is most often embedded within seasonal subsistence activities, then the distribution map of obsidian source use (particularly those sources that most frequently appear in the archaeological record) *should be largely coincident with the overall Holocene subsistence range of the inhabitants of the Fort Rock Basin.*

Given the paucity of obsidian from High Cascades and Newberry Volcano sources, there is little evidence that this range extended very far to the northwest. The large amounts of obsidian from southern sources such as Spodue Mountain suggest that there may have been interaction with the people of the Klamath Basin or at least shared subsistence ranges in the area that lies between the Klamath and Fort Rock basins. The relatively small amounts of obsidian from other major Oregon lake basins (Summer-Abert Lake, Warner, Harney-Malheur, and Catlow), indicates that there was much less substantial interaction with those basins. However, the widespread distribution of locally available obsidian in all three Fort Rock subbasins strongly suggests a high degree of internal interaction and movement throughout the basin.

The Elusive Variety 5

The location of Variety 5, a significant source of obsidian identified at numerous southern Fort Rock Basin sites, has remained unknown since its initial recognition by Hughes (1993, 1995). During the field work conducted for her thesis research, Thatcher (2001)

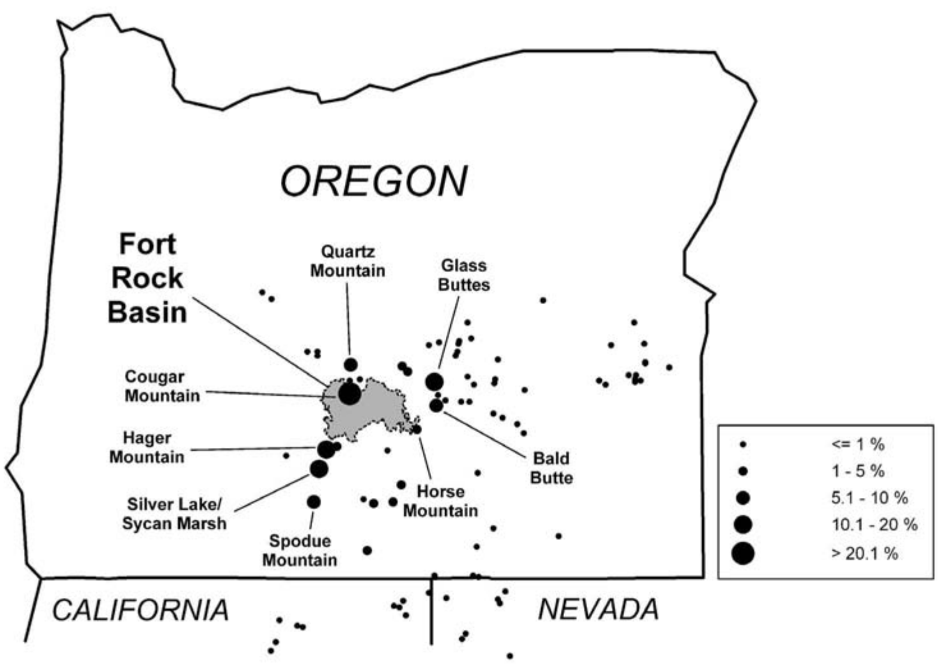


Figure 5. Distribution map of the overall prehistoric obsidian procurement range for the Fort Rock Basin.

searched for this source but was successful only in locating a single small nodule (from a drainage immediately south of Silver Lake) that correlated with the unknown source. However, the geographic distribution of sites where Variety 5 is found (Figure 6) provides us with clues to its approximate position. Artifacts from the Variety 5 source are found exclusively at sites in the southern portion of the Fort Rock Basin, and increase greatly in number at sites in the immediate vicinity of Silver Lake (the largest number of Variety 5 artifacts has been found at Carlon Village, on the south shore of the lake). Although differences in the size of analyzed collections among the different sites where Variety 5 obsidian has been found are not taken into account here, it seems likely—from its distribution and frequency—that the Variety 5 source will eventually be found somewhere very close to Silver Lake. The identification of this unknown and elusive source remains one of our top priorities in the ongoing obsidian source research being carried out in the basin.

An Early Diachronic View

The analysis of our current and rapidly-expanding dataset of characterized obsidian artifacts is far from complete and we have only just begun to carefully examine the data for clues about temporal patterns of obsidian use. However, an earlier critique of 566 chronologically diagnostic projectile points provides us with some indications as to the changing patterns of source use through time in the Fort Rock Basin (Jenkins, Skinner, Thatcher, and Hoar 1999). In this study, all arrowpoints were combined to form a single category (N=256) and all large corner-notch points were combined as an Elko category (N=180). The remainder of the artifacts were represented by 62 Northern Side-notch specimens and 68 Cascade points. Directionality of source use was examined in quadrants relative to a point in the center of the basin. The basic chronologic order of these points was verified by comparison with 104 radiocarbon dates and our obsidian hydration analysis results. All dates were converted to dendrochronologically-calibrated calendrical ages.

Cascade Points. The results indicate substantial variation in directionality of source use through time. Cascade points, generally representing Early and Middle Holocene occupations between 11,000 and 7000 cal. BP, were manufactured from local obsidian only 30% of the time. Populations using Cascade points came to the Fort Rock Basin from all directions and, based on the relatively low frequency of local obsidian, were extremely mobile.

Northern Side-Notch Points. Northern Side-notch points, predominantly made between 7300 and 4000 cal. BP, were made of local obsidian a surprising 64% of the time. Northern Side-notch points were apparently made and used locally in the Fort Rock Basin, suggesting that mobility was substantially reduced during the peak production period of these points.

Elko Points. As evidenced by their extreme range in obsidian hydration values, Elko points are relatively poor chronologic indicators in the Fort Rock Basin sample. Although large corner-notch points may have first appeared more than 9000 years ago in the Fort Rock Basin, they did not occur in the large Pre-Mazama Paulina Lake assemblages nearby and their antiquity is still not known. However, these points commonly occur in very Late Holocene contexts and approximately 77% of the Elko sample were made between 6400 and 1750 cal. BP. The directionality of source use of Elko points is similar to both Northern Side-notch and the later arrowpoints. Elko points were made of local sources 54% of the time. However, the use of nonlocal sources from the southeastern and southwestern sources increased, suggesting an influx of populations or resource exploitation in the Klamath-Modoc, Lake Abert-Chewaucan Marsh, and Warner Lakes regions.

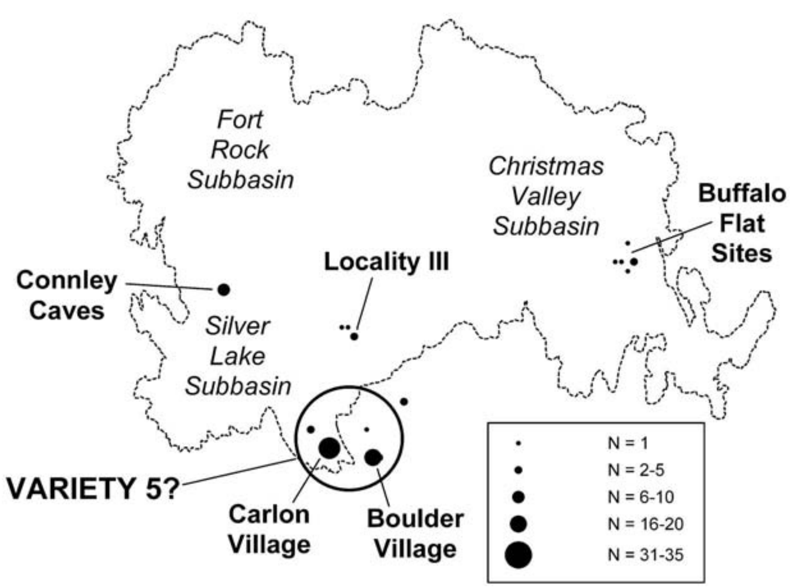


Figure 6. Site locations in the Fort Rock Basin (outline at the1400 m elevation contour) where the unknown Variety 5 source has been found.

Arrowpoints. Arrowpoints are good chronologic indicators with 79% made after about 1900 cal. BP. While in most assemblages arrowpoints generally reflect predominantly local tool stone sources because they are small, easily produced, and less easily resharpened, in the Fort Rock Basin sample they comprise only 41 percent of the specimens. A marked shift in source use direction to the northeast in the direction of the Harney-Malheur Basin and the Ochoco Mountains is accompanied by a reduction in the use of local sources and sources from the southeast. It is clear that in Late Holocene times people came to the Fort Rock Basin from the north and east in record numbers. While the southwest Klamath-Modoc sources remain fairly well-represented, those of the Lake Abert-Chewaucan and Warner Valley sources to the southeast fell dramatically.

Conclusions

Our initial trace element characterization studies of obsidian artifacts from sites located throughout the Fort Rock Basin indicate that an extraordinary variety of local and nonlocal sources were used. The distribution of these sources is used to map and define the overall prehistoric procurement range of the people that inhabited the Fort Rock Basin during the very late Pleistocene and throughout the Holocene Period. An intrabasin look at the geographic distribution of utilized obsidian sources demonstrates significant differences in directionality and intensity of use among the three sub-basins. This is likely the result of the straightforward influence of distance to high-quality sources of obsidian.

Looking back at the four research objectives outlined at the beginning of this chapter, it's clear that we have now made significant progress on three of the four—source identification, artifact characterization, and the identification of basin-wide patterns of obsidian use. Continued studies of regional obsidian sources - their geochemistry, occurrence, and boundaries - and the identification of unknown sources (particularly Variety 5) are still warranted and are in progress. Also required are further trace element investigations of artifacts from a larger collection of geographically diverse sites within the basin. These increased numbers of analyzed artifacts will also allow us to look at other related issues such as those of source diversity and sample size. We can also expand the database of interbasin procurement and contact information to include archaeological sites outside the basin in which local Fort Rock Basin sources of obsidian have been found. For example, characterized artifacts from Cougar Mountain have been found at many sites outside the Fort Rock Basin (Skinner and Winkler 1991, 1994; Musil and O'Neill 1997) and will provide clues about the procurement ranges and interaction of prehistoric people from the Fort Rock Basin and surrounding regions.

This large dataset will also provide us with the necessary information with which to examine other more general methodological aspects of obsidian studies. The effect of sample size on diversity in archaeological assemblages is a topic that has received previous attention in the archaeological literature (Leonard and Jones 1989). What is the relationship of the number of analyzed samples and the number of different obsidian sources identified in a characterized assemblage (source diversity)? How many artifacts do we need to analyze in order to be confident that we have identified all significant sources? How does the geographic proximity (distance and direction) of sources relate to obsidian use and source diversity? How does the selection of categories of artifacts for analysis influence the results of provenance studies? For example, it is evident that a greater number of obsidian sources as well as more distant sources are usually found among formed tools such as projectile points and bifaces. How can we strategically select different categories of artifacts to look at different facets of procurement systems? The results of the trace element and hydration analysis of large numbers of Fort Rock Basin artifacts hold the potential to not only reveal details about the prehistory of the basin but also contain the promise of understanding more far-reaching issues related to provenance studies.

Regarding the identification of temporal patterns of obsidian use, we are well under way with the collection of the necessary typological, radiocarbon, and obsidian hydration data needed to clarify our early impressions. When completed and compiled, the chronologic information will allow considerable further refinement of the temporal issues of source use. The early look at Fort Rock Basin obsidian studies presented here clearly points the direction for future related research in the basin. Stay tuned.

Acknowledgements

The majority of specimens included in these studies were collected by the UO Archaeological Field School (Northern Great Basin Prehistory Project). Principal funding for the analyses was provided by the Lakeview District, Bureau of Land Management. Dr. Harold Bergen paid for the analysis of the Bergen site artifacts and the Oil Dri Corporation paid for the analysis of the DJ Ranch, Bowling Dune, and Locality III artifacts.

References Cited

Adams, D. K., and A. C. Comrey
1997 The North American Monsoon. *Bulletin of the American Meterological Society* 78:2197-2213.

Adovasio, James M.
1970 The Origin, Development and Distribution of Western Archaic Textiles. *Tebiwa: Journal of the Idaho State University Museum* 13(2):1-40. Pocatello.
1974 Prehistoric North American Basketry. In *Collected Papers on Aboriginal Basketry*, edited by Donald R. Tuohy and D. L. Rendell, pp. 98-148. Nevada State Museum Anthropological Papers 16. Carson City.
1986 Prehistoric Basketry. In *Great Basin: Handbook of North American Indians*, Vol. 11, *Great Basin*, edited by Warren L. D'Azevedo, pp. 194-205. Smithsonian Institution, Washington, D.C.

Adovasio, James M., Rhonda L. Andrews, and R. C. Carlisle
1976 The Evolution of Basketry Manufacture in the Northern Great Basin. *Tebiwa: Journal of the Idaho State University Museum* 18(2):1-8.

Adovasio, James. M., Rhonda L. Andrews, and R. C. Carlisle
1986 Basketry. In *Perishable Industries from Dirty Shame Rockshelter, Malheur County, Oregon*, by R. L. Andrews, J. M. Adovasio, and R. C. Carlisle, pp. 19-50. Issued jointly as Ethnology Monographs No. 9, Department of Anthropology, University of Pittsburgh and University of Oregon Anthropological Papers No. 34. Pittsburgh and Eugene.

Adovasio, James M. and David R. Pedler
1994 A Tisket, a Tasket: Looking at the Numic Speakers through the "Lens" of a Basket. In *Across the West: Human Population Movement and the Expansion of the Numa*, edited by David B. Madsen and David Rhode, pp. 114-123. University of Utah, Salt Lake City.

Ahler, S. A., and P. R. Geib
2000 Why Flute? Folsom Point Design and Adaptation. *Journal of Archaeological Science* 27:799-820.

Aikens, C. Melvin
1983 The Far West. In *Ancient Native Americans*, edited by Jesse D. Jennings, pp. 130-181. W.H. Freeman and Company, San Francisco.
1993 *Archaeology of Oregon*. U.S. Department of the Interior, Bureau of Land Management. Portland, Oregon.

Aikens, C. Melvin, David L. Cole, and Robert Stuckenrath
1977 Excavations at Dirty Shame Rockshelter, Southeastern Oregon. *Tebiwa: Miscellaneous Papers of the Idaho State University Museum Of Natural History* 4. Pocatello.

Aikens, C. Melvin, Donald K.Grayson and Peter J. Mehringer, Jr.
1979 Steens Mountain Prehistory Project Interim Report, 1979. Department of Anthropology, University of Oregon, Eugene. Report to the National Science Foundation, Washington, D.C.

Aikens, C. Melvin and Dennis L. Jenkins
1994a Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman. *University of Oregon Anthropological Papers* 50. Eugene.

Aikens, C. Melvin and Dennis L. Jenkins
1994b Environment, Climate, Subsistence, and Settlement: 11,000 Years of Change in the Fort Rock Basin, Oregon. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*. University of Oregon Anthropological Papers 50, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 1-19. Eugene.

Aikens, C. Melvin and Younger T. Witherspoon
1986 Great Basin Numic Prehistory: Linguistics, Archaeology, and Environment. In *Anthropology of the Desert West: Essays in Honor of Jesse D. Jennings*, edited by Carol Condie and Don D. Fowler, pp. 7-20. University of Utah Anthropological Papers No. 110. Salt Lake City: University of Utah Press.

Allely, Steven
1975 A Clovis Point from the Mohawk River Valley, Western Oregon. In *Archaeological Studies in the Willamette Valley, Oregon*, edited by C. .Melvin Aikens, pp 549-552. University of Oregon Anthropological Papers 8. Eugene.

Allison, Ira S.
1979 *Pluvial Fort Rock Lake, Lake County, Oregon.* State of Oregon Department of Geology and Mineral Industries Special Paper 7. Portland.
1982 *Geology of Pluvial Lake Chewaucan, Lake County, Oregon*. Oregon State Monographs, Studies in Geology 11.

Ambroz, Jessica A,
1997 *Characterization of Archaeologically Significant Obsidian Sources in Oregon by Neutron Activation Analysis*. Unpublished Masters Thesis, Department of Chemistry, University of Missouri, Columbia, Missouri.

Ambroz, Jessica A., Michael D. Glascock, and Craig E. Skinner
2001 Chemical Differentiation of Obsidian Within the Glass Buttes Complex, Oregon. *Journal of Archaeological Science* 28:741-746.

Ames, Kenneth M.
1985 Hierarchies, Stress, and Logistical Strategies among Hunter-Gatherers in Northwestern North America. In *Prehistoric Hunter-Gatherers: The Emergence of Cultural Complexity*, edited by T. Douglas Price and J. A. Brown, pp. 155-176.
1988 Early Holocene Forager Mobility Strategies on the Southern Columbia Plateau. In *Early Human Occupation in Far Western North America: the Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens and John L. Fagan, pp. 325-360. Nevada State Museum Anthropological Papers No. 21, Carson City.

Amick, Daniel S.
1995 Patterns of Technological Variation Among Folsom and Midland Projectile Points in the American Southwest. *Plains Anthropologist* 23-38.

Andersen, M. E. and J. E. Deacon
2001 Population Size of Devils Hole Pupfish (*Cyprinodon diabolis*) Correlates with Water Level. *Copeia* 2001:224-228.

Anderson, D. G., L. D. O'Steen, and K. E. Sassaman
1996 Environmental and Chronological Considerations. In *The Paleoindian and Early Archaic Southeast*, edited by D. G. Anderson and K. E. Sassaman, pp. 3-15. University of Alabama Press, Tuscaloosa.

Andrefsky, William
1994 Raw Material Availability and the Organization of Technology. *American Antiquity* 59:21-35.

Andrews, Peter and E. M. Nesbit Evans
1983 Small Mammal Bone Accumulations Produced by Mammalian Carnivores. *Paleobiology* 9(3):289-307.

Andrews, Rhonda L., James. M. Adovasio, and R. C. Carlisle
1986 *Perishable Industries from Dirty Shame Rockshelter, Malheur County, Oregon*. Issued jointly as Ethnology Monographs No. 9, Department of Anthropology, University of Pittsburgh and University of Oregon Anthropological Papers No. 34. Pittsburgh and Eugene.

Antevs, Ernst
1948 The Great Basin, with Emphasis on Glacial and Post-glacial Times: Climatic Changes and Pre-white Man. *Bulletin of the University of Utah* 38:168-191.
1952 Arroyo cutting and filling. *Journal of Geology* 60:375-385.
1953 Geochronology of the Deglacial and Neothermal Ages. *Journal of Geology* 61:195-230.
1955 Geologic-climatic Dating in the West. *American Antiquity* 20, 317-334.
1962 Transatlantic Climatic Agreement Versus C^{14} Dates. *Journal of Geology* 70:194-205.

Arnold, J. R. and W. F. Libby.
1951 Radiocarbon Dates. *Science* 113(2927):111-120.

Atherton, John H.
1966 *Prehistoric Manufacturing Sites at North American Stone Quarries*. Unpublished Master's Thesis, Department of Anthropology, University of Oregon, Eugene, Oregon.

Babcock, Michael
1996 Fort Rock Basin Archaeology: DJ Ranch Stratigraphic and Lithic Analysis of the Upper Excavation Block, Trench 1. Ms.in University of Oregon archaeological field school files.

Bacon, C. R.
1983 Eruptive History of Mount Mazama and Crater Lake Caldera, Cascade Range, U. S. A. *Journal of Volcanology and Geothermal Research* 18:57-115.

Baker, R. G.
1983 Holocene Vegetation History of the Western United States. In *Late Quaternary Environments of the United States, Vol. 2, The Holocene*, edited by H. E. Wright, Jr., pp. 109-127. University of Minnesota Press, Minneapolis.

Baldwin, Ewart M.
1981 *Geology of Oregon*. Kendall/Hunt Publishing, Dubuque, Iowa.

Bamforth, Douglas B.
1986 Technological Efficiency and Tool Curation. *American Antiquity* 51:38-50.

Barrett, Samuel A.
1910 The Material Culture of the Klamath Lake and Modoc Indians of Northeastern California and Southern Oregon. *University of California Publications in American Archaeology and Ethnology* 5(4):239-292. Berkeley.

Barry, R. G., and R. J. Chorley
1992 *Atmosphere, Weather, and Climate.* Routledge, New York.

Bartlein, P. J., M. E. Edwards, S. L. Shafer, E. D. Barker, Jr.
1995 Calibration of Radiocarbon Ages and the Interpretation of Paleoenvironmental Records. *Quaternary Research* 44:417-424.

Bartlein, Patrick J., K. H. Anderson, P. M. Anderson, M. E. Edwards, C. J. Mock, R. S. Thompson, R. S. Webb, T. Webb III, and Catherine Whitlock
1998 Paleoclimate Simulations for North America Over the Past 21,000 Years: Features of the Simulated Climate and Comparisons with Paleoenvironmental Data. *Quaternary Science Reviews 17*:549-585.

Basgall, Mark E.
1988 Archaeology of the Komodo Site, and Early Holocene Occupation in Central-Eastern California. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 103-119. Nevada State Museum Anthropological Papers No. 21, Carson City.

Batchelder, G. L.
1970 *Postglacial ecology at Black Lake, Mono County, California.* Unpublished PhD dissertation. Arizona State University, Tempe.

Baxter, Paul W.
1986 *Archaic Upland Adaptations in the Central Oregon Cascades*. Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

Beaton, John M.
1991 PaleoIndian Occupation Greater than 11,000 Years B.P. at Tule Lake, Northern California. *Current Research in the Pleistocene* 8:5-7.

Beck, Charlotte and George T. Jones
1990 Toolstone Selection and Lithic Technology in Early Great Basin Prehistory. *Journal of Field Archaeology* 17:283-299.
1997 The Terminal Pleistocene/Early Holocene Archaeology of the Great Basin. *Journal of World Prehistory* 11(2):161-236.
2003 Were There People in the Great Basin before 12,000 years ago? In *On Being First: Cultural Innovation and Environmental Consequences of First Peopling*, edited by Jason Gillespie, Susan Tapakka, and Christy de Mille, pp 453-469. Proceedings of the 31st Chacmool Conference,

2001. The Archaeological Association of the University of Calgary.

n.d. *The Paleoarchaic Occupation of Eastern Nevada: Volume I. The Sunshine Locality*. With contributions by Jack M. Broughton, Michael Cannon, Amy Dansie, Amy Holmes, Gary Huckleberry, Stephanie Livingston, and Donald R. Tuohy. University of Utah Anthropological Papers, in preparation.

Beckham, Stephen Dow

1983 Cow Creek Band of Umpqua Tribe of Indians: Resource Utilization Study. Exhibit A to report prepared for "Cow Creek Band of Umpqua Tribe of Indians v. United States," Docket No. 53-81L, US Claims Court, Washington, D.C.

Bedwell, Stephen F.

1970 *Prehistory and Environment of the Pluvial Fort Rock Lake Area of Southcentral Oregon*. Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

1973 *Fort Rock Basin: Prehistory and Environment*. University of Oregon Books. Eugene.

Bedwell, Stephen F. and Luther S. Cressman

1971 Fort Rock Report: Prehistory and Environment of the Pluvial Fort Rock Lake Area of South-Central Oregon. In *Great Basin Anthropological Conference 1970: Selected Papers*, edited by C. Melvin Aikens, pp. 1-25. University of Oregon Anthropological Papers 1. Eugene.

Behrensmeyer, Anna K.

1978 Taphonomic and Ecological Information from Bone Weathering. *Paleobiology* 4(2):150-162.

Bennyhoff, James A. and Richard E. Hughes

1987 *Shell Bead and Ornament Exchange Networks Between California and the Western Great Basin*. Anthropological Papers of the American Museum of Natural History 64(2). New York.

Benson, L. V., D. R. Currey, R. I. Dorn, K. R. Lajoie, C. G. Oviatt, S. W. Robinson, G. I. Smith, and S. Scott

1990 Chronology of Expression and Contraction of Four Great Basin Lake Systems during the Past 35,000 Years. *Palaeogeography, Palaeoclimatology, Palaeoecology* 78:241-286.

Benson, L., and R. S. Thompson

1987 The Physical Record of Lakes in the Great Basin. In *North America and Adjacent Oceans During the Last Deglaciation. Geology of North America, vol. K-3*, edited by W. F. Ruddiman and H. E. Wright Jr., pp. 241-260. Geological Society of America, Boulder, Colorado.

Bergen, Harold G.

1992 Personal Field Notes from Artifact Collecting Trips to the Fort Rock and Christmas Valley Region. On file at the Thomas Burke Memorial Washington State Museum, University of Washington, Seattle.

Berger, A.

1978 Long-term Variations of Caloric Insolation Resulting from the Earth's Orbital Elements. *Quaternary Research* 9:139-167.

Berger, A., and Loutre, M. F.

1991 Insolation Values for the Climate of the Last 10 Million Years. *Quaternary Science Reviews* 10:297-317.

Bettinger, Robert L.

1999a Faces in Prehistory: Great Basin Wetlands Skeletal Populations. In *Prehistoric Lifeways in the Great Basin Wetlands: Bioarchaeological Reconstruction and Interpretation*, edited by Brian E. Hemphill and Clark S. Larsen, pp. 321-332. University of Utah Press, Salt Lake City.

1999b What Happened in the Medithermal? In *Models for the Millennium: Great Basin Anthropology Today*, edited by Charlotte Beck, pp. 62-74. University of Utah Press. Salt Lake City.

Bevill, Russell, Michael S. Kelly, and Elena Nilsson

1994 Archaeological Data Recovery at 35DO37, A Pre-Mazama Site on the South Umpqua River, Douglas County, Oregon. Report to the Umpqua National Forest by Mountain Anthropological Research, Chico, California.

Billings, W. D.

1951 Vegetational zonation in the Great Basin of western North America. *Les Bases Ecologiques de la Regeneration de la Vegetation des Zones Arides*. Internationale Union Société Biologique, Series B, 101-122.

Binford, Lewis R.

1972 *An Archaeological Perspective*. Seminar Press, New York.

1973 Interassemblage Variability–The Mousterian and the "Functional" Argument. In *The Explanation of Culture Change*, edited by Colin Renfrew, pp. 227-254. Duckworth, London.

1979 Organization and Formation Processes: Looking at Curated Technologies. *Journal of Anthropological* Research 35:255-273.

1980 Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation. *American Antiquity* 45:4-20.

1981 *Bones: Ancient Men and Modern Myths.* Academic Press, New York.

Birks, H. J. B. and H. H. Birks

1980 *Quaternary Palaeoecology*. Edward Arnold, London.

Bocek, Barbara

1986 Rodent Ecology and Burrowing Behavior: Predicted Effects on Archaeological Site Formation. *American Antiquity* 51(3):589-603.

1992 The Jasper Ridge Reexcavation Experiment: Rates of Artifact Mixing by Rodents. *American Antiquity* 57(2):261-269.

Bohrer, Vorsilla L.

1986 Guideposts in Ethnobotany. *Journal of Ethnobiology* 6(1): 27-43.

Bohrer, Vorsilla L. and Karen R. Adams

1977 *Ethnobotanical Techniques and Approaches at Salmon Ruin, New Mexico*. San Juan Valley Archaeological Project Technical Series 2; Eastern New Mexico Contributions in Anthropology 8(1).

Boldurian, Anthony T.

1990 *Lithic Technology at the Mitchell Locality of Blackwater Draw: A Straified Folsom Site in Eastern New Mexico.* Plains Anthropologist, Memoir 24.

Boldurian, Anthony T., and John L. Cotter
1999 *Clovis Revisited. New Perspectives on Paleoindian Adaptations from Blackwater Draw, New Mexico*. The University Museum, University of Pennsylvania, Philadelphia.
Bonaccorso, F. J. and J. H. Brown
1972 House Construction of the Desert Woodrat, (*Neotoma lepida lepida*). *Journal of Mammology* 53:283-288.
Bonstead, L. and D. C. Young
2000 Life's a Beach: Sundance Excavations at an Early Holocene Site, Harney Lake, Oregon. Poster presented at the 65th Annual Meeting of the Society for American Archaeology, Philadelphia, PA.
Booth, Ernest S.
1961 *How to Know Mammals*. Wm. C. Brown, Iowa.
Bowler, J. M.
1973 Clay Dunes: Their Occurrence, Formation and Environmental Significance. *Earth Science Reviews* 9:315-338.
Bradley, Bruce A.
1993 Paleo-Indian Flaked Stone Technology in the North American High Plains. In *From Kostenki to Clovis: Upper Paleolithic--Paleo-Indian Adaptations*, edited by Olga Soffer and N. D. Praslov, pp. 251-262. Plenum Press, New York.
Brady, Nyle C. and Ray R. Weil
1996 *The Nature and Properties of Soils*. Prentice-Hall, New York.
Brashear, Ann
1994 Assemblage Variation, Site Types, and Subsistence Activities in the Boulder Village Uplands, Fort Rock Basin, Oregon. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 385-430. University of Oregon Anthropological Papers 50. Eugene.
Brauner, David and Robert Nisbet, Jr.
1983 The Reevaluation of Cultural Resources Within the Applegate Lake Project Area, Jackson County, Oregon. Phase III: Archaeological Salvage of Sites 35JA52 and 35JA53. Report to the US Army Corps of Engineers, Portland District, by the Department of Anthropology, Oregon State University, Corvallis.
Bright, R. C.
1966 Pollen and Seed Stratigraphy of Swan Lake, Southeastern Idaho. *Tebiwa* 9:1-47.
Broilo, F. J.
1971 *An Investigation of Surface Collected Clovis, Folsom, and Midland Projectile Points from Blackwater Draw and Adjacent Localities*. M.A. Thesis, Department of Anthropology, Eastern New Mexico University.
Brown, D. E.
1994a Great Basin Conifer Woodland. In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by D. E. Brown, pp. 52-57. University of Utah Press, Salt Lake City.
1994b Great Basin Montane Scrubland. In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by D. E. Brown, pp. 83-84. University of Utah Press, Salt Lake City.
Bryan, Alan L.
1988 The Relationship of the Stemmed Point and Fluted Point Traditions in the Great Basin. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 53-74. Nevada State Museum Anthropological Papers No. 21, Carson City.
Bryan, Alan L. and Donald R. Tuohy
1999 Prehistory of the Great Basin/Snake River Plain to about 8,500 Years Ago. In *Ice Age Peoples of North America: Environments, Origins, and Adaptations*, edited by Robson Bonnichsen and Karen L. Turnmire, pp. 249-263. Oregon State University Press, for the Center for the Study of the First Americans, Corvallis.
Bryant, V. M., Jr., R. G. Holloway, J. G. Jones and D. L. Carlson
1994 Pollen Preservation in Alkaline Soils of the American Southwest. In *Sedimentation of Organic Particles*, edited by A. Traverse, pp. 47-58. Cambridge University Press, Cambridge.
Bryson, R. A., and F. K. Hare
1974 The Climates of North America. In *Climates of North America*, edited by R.A. Bryson and F.K. Hare, pp. 1-47. *World Survey of Climatology*, Vol. 11.
Burt, W. H. and R. P. Grossenheider
1980 *A Field Guide to the Mammals*. Houghton Mifflin Company. Boston, Massachusetts.
Buikstra, J. E., and M. Swegle
1989 Bone Modification Due to Burning: Experimental Evidence. In *Bone Modification*, edited by Robson Bonnichsen and M. H. Sorg. Orono: University of Maine Center for the Study of the First Americans.
Byram, R. Scott
1994 Holocene Settlement Change in the Boulder Village Uplands. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 369-384. University of Oregon Anthropological Papers 50. Eugene.
Byram, R. Scott, Thomas J. Connolly and Robert R. Musil
1999 Newberry Crater Debitage Analysis. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*, edited by Thomas J. Connolly, pp. 131-150. University of Utah Anthropological Papers No. 121, Salt Lake City.
Callahan, Errett
1979 The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flintknappers and Lithic Analysts. *Archaeology of Eastern North America* 7:1-179.
Cannon, William J. and Roger Wiggin
1975 Preliminary Reconnaissance of the Alvord Region, with Notes on a New Plano-like Assemblage from Southeastern Oregon. Paper presented at the

Northwest Anthropological Conference, Seattle, Washington.

Carlson, Roy L.

1983 The Far West. In *Early Man in the New World*, edited by R. Shutler, Jr, pp. 73-96. Sage Publications, Beverly Hills.

1994 Trade and Exchange in Prehistoric British Columbia. In *Prehistoric Exchange Systems in North America*, edited by Timothy G. Baugh and Jonathon E. Ericson, pp. 307-361. Plenum Press, New York, New York.

Charnov, E. L.

1976 Optimal Foraging: The Marginal Value Theorem. *Theoretical Population Biology* 9:129-136.

Carter, J. and D. Dugas

1994 Holocene Occupation at Sodhouse Spring: Results of the 1993 Field Season. Paper presented at the 24th Great Basin Anthropological Conference, Elko, Nevada.

Cheatham, Richard D.

1988 Late Archaic Settlement Pattern in the Long Tom Sub-basin, Upper Willamette Valley, Oregon. *University of Oregon Anthropological Papers* 39. Eugene.

Clark, D. H., and A. R. Gillespie

1997 Timing and Significance of Late-glacial and Holocene Cirque Glaciation in the Sierra Nevada, California. *Quaternary International* 38/39:21-38.

Clewlow, C. William

1968 Surface Archaeology in the Black Rock Desert, Nevada. *Reports of the University of California Archaeological Research Facility* 73:1-93.

COHMAP Members

1988 Climatic Changes of the Last 18,000 Years: Observations and Model Simulations. *Science* 241:1043-1052.

Connolly, Thomas J.

1994a Paleo Point Occurrences in the Willamette Valley, Oregon. In *Contributions to the Archaeology of Oregon, 1990-1994*, P.W. Baxter (ed), pp 81-88. Association of Oregon Archaeologists Occasional Papers 5, Eugene.

1994b Prehistoric Basketry from the Fort Rock Basin and Vicinity. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 63-83. University of Oregon Anthropological Papers 50. Eugene.

1995 Human and Environmental Holocene Chronology in Newberry Crater, Central Oregon. State Museum of Anthropology, University of Oregon.

1999a *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*. University of Utah Anthropological Papers No. 121, Salt Lake City.

1999b Summary and Conclusions. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*, edited by Thomas J. Connolly, pp. 221-244. University of Utah Anthropological Papers No. 121, Salt Lake City.

Connolly, Thomas J. and William S. Cannon

1999 Comments on "America's Oldest Basketry." *Radiocarbon* 41(3):309-313.

2000 Basketry Chronology of the Pre-Mazama Period in the Northern Great Basin. Paper presented at the 27th Great Basin Anthropological Conference, Ogden, Utah, October 5-7, 2000.

Connolly, Thomas J., Catherine S. Folwer, and William S. Cannon

1998 Radiocarbon Evidence Relating to Northern Great Basin Basketry Chronology. *Journal of California and Great Basin Anthropology* 20(1):88-100.

Connolly, Thomas J. and Dennis L. Jenkins

1997 Population Dynamics on the Northwestern Great Basin Periphery: Clues from Obsidian Geochemistry. *Journal of California and Great Basin Anthropology* 19:241-250.

1999 The Paulina Lake Site (35DS34). In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*, edited by Thomas J. Connolly, pp. 86-127. University of Utah Anthropological Papers No. 121, Salt Lake City.

Connolly, Thomas J., Dennis L. Jenkins, and Jane Benjamin

1993 *Archaeology of Mitchell Cave (35WH122): A Late Period Hunting Camp in the Ochoco Mountains, Wheeler County, Oregon*. University of Oregon Anthropological Papers 46. Eugene.

Cope, E. D.

1889 The Silver Lake of Oregon and its Region. *The American Naturalist* 23:970-982.

Corbet, G. B. and J. E. Hill

1991 *A World List of Mammalian Species*. Oxford University, New York.

Couture, Marilyn

1978 *Recent and Contemporary Foraging Practices of the Harney Valley Paiute*. Master's thesis, Portland State University.

Couture, Marilyn, Mary F. Ricks, and Lucile Housley

1986 Foraging Behavior of a Contemporary Northern Great Basin Population. *Journal of California and Great Basin Anthropology* 8(2):150-160.

Cowles, John

1960 *Cougar Mountain Cave in South Central Oregon*. Daily News Press, Rainier, Oregon.

Crabtree, Don E.

1966 A Stoneworker's Approach to Analyzing and Replicating the Lindenmeier Folsom. *Tebiwa* 9:3-39.

Cressman, Luther S.

1940a Studies on Early Man in South Central Oregon. In *Carnegie Institution of Washington Year Book* No. 39:300-306. Washington D.C.

1940b *Early Man in the Northern Part of the Great Basin of South-Central Oregon*. Proceedings of the Sixth Pacific Science Congress 4:169-175. University of California, Berkeley.

1942 *Archaeological Researches in the Northern Great Basin*. Carnegie Institution of Washington Publication, 538. Washington, D.C.

1951 Western Prehistory in the Light of Carbon-14 Dating. *Southwestern Journal of Anthropology* 7(3):289-313.

1986 Prehistory of the Northern Area. In *Handbook of North American Indians*, Volume 11: *Great Basin*, edited by Warren L. D'Azevedo, pp. 120-126. Smithsonian Institution, Washington, D.C.

Cressman, Luther S. and Howel Williams

1940 Early Man in Southcentral Oregon: Evidence from Stratified Sites. In *Early Man in Oregon: Archaeological Studies in the Northern Great Basin*. University of Oregon Monographs, Studies in Anthropology No. 3. Eugene.

Cressman, Luther S., Howel Williams, and Alex D. Krieger

1940 *Early Man in Oregon: Archaeological Studies in the Northern Great Basin*. University of Oregon Monographs, Studies in Anthropology 3. Eugene.

Culin, Stewart

1907 *Games of the North American Indians*. Twenty-Fourth Annual Report of the Bureau of American Ethnology, 1902-1903, by W. H. Holmes, Smithsonian Institution, Washington D.C.

Currey, D. R.

1994b Hemiarid Lake Basins: Hydrographic Patterns. In *Geomorphology of Desert Environments*, edited by A. D. Abrahams and A. J. Parsons, pp. 405-421. Chapman & Hall, London.

Dance, S. P., editor

1982 *The Collector's Encyclopedia of Shells*. McGraw-Hill Book Company, New York.

Daniel, I. Randolph, Jr.

2001 Stone Raw Material Availability and Early Archaic Settlement in the Southeastern United States. *American Antiquity* 66:237-265.

Davis, Emma L. and Richard Shutler, Jr.

1969 Recent Discoveries of Fluted Points in California and Nevada. *Nevada State Museum Anthropological Papers* 14:154-169. Carson City.

Davis, O. K.

1984 Multiple Thermal Maxima during the Holocene. *Science* 225:617-619.

1989 The Regionalization of Climate Change in Western North America. In *Paleoclimatology and Paleometerology: Modern and Past Patterns of Global Atmospheric Transport*, edited by M. Leinen and M. Sarnthein, pp. 617-636. Kluwer Academic Publishers.

1999 Pollen Analysis of a Late-glacial and Holocene Sediment Core from Mono Lake, Mono County, California. *Quaternary Research* 52:243-249.

Deller, D. B., and C. J. Ellis

1992 *Thedford II. A Paleo-Indian Site in the Ausable River Watershed of Southwestern Ontario*. Memoirs of the Museum of Anthropology no. 24. University of Michigan, Ann Arbor.

DeQuille, Dan (William Wright)

1963 *Washoe Rambles*. Western Lore Press, Los Angeles.

Dillian, Carolyn D.

2002 *More Than Toolstone: Differential Utilization of Glass Mountain Obsidian*. Unpublished Ph.D. Dissertation, Department of Anthropology, University of California, Berkeley, California.

Douglas, M. W., R. A. Maddox, K. Howard, and S. Reyes

1993 The Mexican Monsoon. *Journal of Climate* 6:1665-1677.

Draper, John A.

1996 Archaeology of the Tiller Site: Pre-Mazama Occupation in the South Umpqua River Basin. Report to the Umpqua National Forest by 4D-CRM, Darrington, Washington.

Droz, Michael S.

1997 *Geomorphic and Climatic History of Holocene Channel, Playas, and Lunettes in the Fort Rock Basin, Lake County, Oregon.* Unpublished M.A. thesis, Department of Geography, University of Oregon, Eugene.

Droz, Michael S. and Dennis L. Jenkins

1998 Geoarchaeology of Wetland Settings in the Fort Rock Basin, South Central Oregon. Paper presented at the 26th Great Basin Anthropological Conference, Bend, Oregon.

Earle, Timothy K.

1982 Prehistoric Economics and the Archaeology of Exchange. In *Contexts for Prehistoric Exchange*, edited by Jonathon E. Ericson and Timothy K. Earle, pp. 1-12. Academic Press, New York.

Eerkens, Jelmer, Jay King, and Michael D. Glascock

2002 Artifact Size and Chemical Sourcing: Studying the Potential Biases of Selecting Larger Artifacts for Analysis. *Society for California Archaeology Newsletter* 36(3):25-29.

Eiseldt, B. Sunday

1998 Household Activity and Marsh Utilization in the Archaeological Record of Warner Valley: The Peninsula Site. University of Nevada, Reno, Department of Anthropology Technical Report 98-2.

Ericson, Jonathon E.

1981 *Exchange and Production Systems in Californian Prehistory: The Results of Hydration Dating and Chemical Characterization of Obsidian Sources*. BAR International Series 110, Oxford, England.

Erlandson, Jon M.

1984 A Case Study in Faunal Turbation: Delineating the Effects of the Burrowing Pocket Gopher on the Distribution of Archaeological Materials. *American Antiquity* 49(4):785-790.

Erlandson, Jon M., Rene L. Vellanoweth, Annie and Caruso

2001 Dentalium Shell Artifacts from a 6600 Year Old Occupation at Otter Cave, San Miguel Island. *Pacific Coast Archaeological Society Quarterly* 37(3):451-456.

Fagan, John L.

1974 *Altithermal Occupation of Spring Sites in the Northern Great Basin*. University of Oregon Anthropological Papers 6. Eugene.

1975 A Supposed Fluted Point from Fort Rock Cave, an Error of Identification and Its Consequences. *American Antiquity* 40(3):356-357.

1983 Clovis: The Dietz Clovis Site - A Status Report. *Current Archaeological Happenings in Oregon* 8(2):3-4.

1984a Archaeological Investigations at the Dietz Clovis Site, 1984. *Current Archaeological Happenings in Oregon* 10(1):3-6.
1984b The Dietz Site, A Clovis Base Camp in South-Central Oregon. Paper presented at the 49th Annual Meeting of the Society for American Archaeology, April 12, Portland, Oregon.
1984c Northern Great Basin Fluting Technology at the Dietz Site. Paper presented at the 19th Great Basin Anthropological Conference, Boise, Idaho.
1986a Clovis and Western Pluvial Lakes Tradition Lithic Technology at the Dietz Site in South-Central Oregon. Paper presented at the 51st Annual Meeting of the Society for American Archaeology, April 25.
1986b Western Clovis Occupation in South-Central Oregon: Archaeological Research at the Dietz Site 1983-1985. *Current Research in the Pleistocene* 3:3-5.
1988 Clovis and Western Pluvial Lakes Tradition Lithic Technologies at the Dietz Site in South-Central Oregon. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by J. A. Willig, C. M. Aikens, and J. L. Fagan, pp. 389-416. Nevada State Museum Anthropological Papers No. 21, Carson City.
1990 Temporal and Technological Variability in the Use of Obsidian at the Dietz Site. Paper presented at the 43rd Annual Northwest Anthropological Conference, March 24, Eugene, Oregon.
1996 Obsidian Hydration Analysis of Clovis and Western Pluvial Lakes Artifacts from the Dietz Site. Paper presented at the 25th Great Basin Anthropological Conference, October 10-12, 1996, Kings Beach, California.

Fagan, John L. and Gary L. Sage
1974 New Windust Sites in Oregon. *Tebiwa* 16(2):68-71.

Ferguson, G. J. and F. W. Libby
1962 UCLA Radiocarbon Dates I. *Radiocarbon* 4:109-104.

Ferring, C. R.
1995 The Late Quaternary Geology and Archaeology of the Aubrey Site, Texas: A Preliminary Report. In *Ancient Peoples and Landscapes*, edited by E. Johnson, pp. 273-281. Museum of Texas Tech University, Lubbock.

Flenniken, J. Jeffrey
1978 Reevaluation of the Lindenmeier Folsom: A Replication Experiment in Lithic Technology. *American Antiquity* 43:473-480.

Forbes, Charles F.
1973 *Pleistocene Shoreline Morphology of the Fort Rock Basin, Oregon*. Ph.D. Dissertation, Department of Geography, University of Oregon, Eugene.

Ford, Richard I.
1978 *The Nature and Status of Ethnobotany*. Anthropological Papers 67, Museum of Anthropology, University of Michigan.
1979 Paleoethnobotany in American Archaeology. In *Advances in Archaeological Method and Theory*, Vol. 2., edited by Michael B. Schiffer, pp. 285-336. Academic Press, New York.

Fowler, Catherine S.
1982 Settlement Patterns and Subsistence Systems: Ethnographic Record. In *Man and Environment in the Great Basin*, edited by David B. Madsen and James F. O'Connell, pp. 121-138. SAA Papers 2.
1986 Subsistence. In *Handbook of Native American Indians,* Vol. 11, *Great Basin*. Smithsonian Press, Washington, D.C.
1989 *Willard Z. Park's Ethnographic Notes on the Northern Paiute of Western Nevada, 1933-1940, Volume 1*. University of Utah Anthropological Papers 114, Salt Lake City, Utah.
1990 *Tule Technology. Northern Paiute Uses of Marsh Resources in Western Nevada*. Smithsonian Institution Press, Washington, D.C.
1994 Material Culture and the Proposed Numic Expansion. In *Across the West: Human Population Movement and the Expansion of the Numa*, edited by David B. Madsen and David Rhode, pp. 103-113. University of Utah, Salt Lake City.

Fowler, Catherine S. and William J. Cannon
1992 Catlow Twine and Warner Valley Prehistory. Paper presented at the Great Basin Anthropological Conference, Boise.

Fowler, Catherine S. and Sven Liljeblad
1986 Northern Paiute. In *Handbook of North American Indians*: Vol. 11, *Great Basin*, edited by Warren L. d'Azevedo, pp. 435-465. Washington D.C: Smithsonian Institution.

Fowler, Don D. and Catherine S. Fowler
1971 *Anthropology of the Numa: John Wesley Powell's Manuscripts on the Numic Peoples of Western North America, 1868-1880*. Smithsonian Contributions to Anthropology 14. Washington.

Franklin, Jerry F. and C. T. Dyrness
1988 *Natural Vegetation of Oregon and Washington*. Oregon State University Press, Corvallis.

Freidel, Dorothy E.
1993 *Chronology and Climatic Controls of Late Quaternary Lake-level Fluctuations in Chewaucan, Fort Rock, and Alkali Basins, South-central Oregon.* Unpublished Ph.D. dissertation, University of Oregon, Eugene.
1994 Paleolake Shorelines and Lake Level Chronology of the Fort Rock Basin, Oregon. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 21-40. University of Oregon Anthropological Papers 50. Eugene.
1996 Geomorphic Setting: Terrace Formation Along the North Umpqua River. *In* Streamside Occupations in the North Umpqua River Drainage Before and After the Eruption of Mount Mazama, by Brian L. O'Neill, Thomas J. Connolly, and Dorothy E. Freidel, pp 21-45. *Oregon State Museum of Anthropology Report* 96-2, University of Oregon, Eugene, Oregon.
1998 Lake Level Oscillation at Paleolake Chewaucan, Oregon during the Pleistocene-Holocene

Transition. Paper presented at the 15th Biennial Quaternary Association Meetings, Puerto Vallarta, Mexico.
2001 Pleistocene Lake Chewaucan: Two Short Pieces on Hydrological Connections and Lake-level Oscillations. In *Quaternary Studies near Summer Lake, Oregon: Friends of the Pleistocene Ninth Annual Pacific Northwest Cell Field Trip September 28-30, 2001*, edited by Rob Negrini, Silvio Pezzopane, and Tom Badger, pp. DF.1-DF.3.

Freidel, Dorothy E. and Brian L. O'Neill
1998 Holocene River Terraces and Human Occupation along the North Umpqua River, Oregon. Paper presented to the 63rd Annual Meeting of the Society of American Archaeology, Seattle, Washington.

Freidel, Dorothy E., Lynn Peterson, Patricia F. McDowell, and Thomas J. Connolly
1989 Alluvial Stratigraphy and Human Prehistory of the Veneta Area, Long Tom River Valley, Oregon: The Final Report of the Country Fair/Veneta Archaeological Project. Report to the National Park Service and the Oregon State Historic Preservation Office by Oregon State Museum of Anthropology and Department of Geography, University of Oregon, Eugene, Oregon.

Friedman, Irving
1968 Hydration Rind Dates Rhyolite Flows. *Science* 159:878-880.
1977 Hydration Dating of Volcanism at Newberry Crater, Oregon. *U.S. Geological Survey Journal of Research* 5(3):337-342.

Friedman, Irving and William Long
1976 Hydration Rate of Obsidian. *Science* 191:347-352.

Friedman, Irving and Robert L. Smith
1960 A New Dating Method Using Obsidian, Part 1: The Development of the Method. *American Antiquity* 25:476-522.

Friedman, Irving and Fred Trembour
1983 Obsidian Hydration Dating Update. *American Antiquity* 48:544-547.

Friedman, Janet
1978 *Wood Identification by Microscopic Examination: A Guide for the Archaeologist on the Northwest Coast of North America*. British Columbia Provincial Museum Heritage Record No. 5. British Columbia, Canada.

Frison, George C.
1993 North American High Plains Paleo-Indian Hunting Strategies and Weaponry Assemblages. In *From Kostenki to Clovis. Upper Paleolithic-Paleo-Indian Adaptations*, edited by O. Soffer and N. D. Praslov, pp. 237-249. Plenum Press, New York.

Frison, George C. and B. Bradley
1999 *The Fenn Cache. Clovis Weapons and Tools.* One Horse Land and Cattle Company, Santa Fe.

Fry, G. F.
1976 *Analysis of Prehistoric Coprolites from Utah.* University of Utah Anthropological Papers No. 97. Salt Lake City.

Gabrielson, Ira N. and Stanley G. Jewett
1970 *Birds of Oregon*. Dover Publications, New York.

Galm, Jerry R.
1994 Prehistoric Trade and Exchange in the Interior Plateau of Northwestern North America. In *Prehistoric Exchange Systems in North America*, edited by Timothy G. Baugh and Jonathan E. Ericson, pp. 275-305. Plenum Press, New York and London.

Gasser, Robert E., and E. Charles Adams
1981 Aspects of Deterioration of Plant Remains in Archaeological Sites: The Walpi Archaeological Project. *Journal of Ethnobiology 1(1)*:182-192.

Geib, Phil R.
2000 Sandal Types and Archaic Prehistory on the Colorado Plateau. *American Antiquity* 63(3):509-524

Gifford, E.W.
1946 *Californian Bone Artifacts*. University of California Publications in Anthropological Records, Vol. 3. University of California Press, Berkeley.

Gleason, Henry A. and Arthur Cronquist
1964 *The Natural Geography of Plants*. New York: Columbia University Press.

Goodyear, Albert C.
1982 The Chronological Position of the Dalton Horizon in the Southeastern United States. *American Antiquity* 47:382-95.
1989 A Hypothesis for the Use of Cryptocrystalline Raw Materials Among Paleoindian Groups of North America. In *Eastern Paleoindian Lithic Resource Use*, edited by C. J. Ellis and J. C. Lothrop, pp. 1-9. Westview Press, San Francisco, California.

Gray, Dennis
1993 Analysis of the Fish Lake Artifact Collection, Site 35JA163, Jackson County, Oregon. Report to the Rogue River National Forest by Cascade Research, Ashland, Oregon.

Grayson, Donald K.
1979 Mount Mazama, Climatic Change, and Fort Rock Basin Archaeofaunas. In *Volcanic Activity and Human Ecology*, edited by Payson D. Sheets and Donald K. Grayson, pp. 427-458. Academic Press.
1984 *Quantitative Zooarchaeology*. Academic Press, New York.
1993 *The Desert's Past. A Natural Prehistory of the Great Basin*. Smithsonian Institution Press, Washington, D.C.

Grayson, Donald K. and Michael D. Cannon
1999 Human Paleoecology and Foraging Theory in the Great Basin. In *Models for the Millennium: Great Basin Anthropology Today*, edited by Charlotte Beck, pp. 141-151. University of Utah Press. Salt Lake City.

Greenspan, Ruth L.
1990 Prehistoric Fishing in the Northern Great Basin. In *Wetlands Adaptations in the Great Basin*, edited by Joel Janetski and David B. Madsen, pp. 207-232. Museum of Peoples and Cultures Occasional Papers No. 1.
1993 Analysis of the Buffalo Flat vertebrate faunal remains. In *The Archaeology of Buffalo Flat: Cultural Resources Investigations for the Conus*

OTH-B Buffalo Flat Radar Transmitter Site, Christmas Lake Valley, Oregon, Volume 2: Analyses, Synthesis, Appendices, edited by Albert C. Oetting, pp. 613-674. Heritage Research Associates Report No. 151, on file at the U.S. Army Corps of Engineers, Seattle District.

1994 Archaeological Fish Remains in the Fort Rock Basin. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 485-504. University of Oregon Anthropological Papers 50. Eugene.

Hall, E. R. and K. R. Kelson

1959 *The Mammals of North America*, 2 volumes. The Ronald Press Co., New York.

Hampton, E. R.

1964 *Geologic Factors That Control the Occurrence and Availability of Ground Water in the Fort Rock Basin, Lake County, Oregon*. U. S. Geological Survey Professional Paper 383-B.

Hanes, Richard C.

1976 Umpqua Valley Prehistory: A First Step Toward Understanding Aboriginal Adaptations to the Southwest Oregon Interior Region. Ms. on file at the Roseburg District Bureau of Land Management, Roseburg, Oregon.

Harris, Jack S.

1940 The White Knife Shoshoni of Nevada. In *Acculturation in Seven American Indian Tribes*. Ralph Linton, editor, pp. 39-116. Appleton-Century. New York.

Hastorf, Christine, and Virginia S. Popper

1988 *Current Paleoethnobotany: Analytical Methods and Cultural Interpretations of Archaeological Plant Remains*. The University of Chicago Press.

Hattori, Eugene M., Catherine S. Fowler, and Pat Barker

2000 Prehistoric Perishable Artifact Manufacture and Use in the Western Great Basin. Paper presented at the 27th Great Basin Anthropological Conference, Ogden, Utah, October 5-7, 2000.

Haynes, Gary

1980 Evidence of Carnivore Gnawing on Pleistocene and Recent Mammalian Bones. *Paleobiology* 6(3):341-351.

Haynes, C. Vance, Jr.

1991 Geoarchaeological and Paleohydrological Evidence for a Clovis-age Drought in North America and its Bearing on Extinction. *Quaternary Research* 35:438-450.

1992 Contributions of Radiocarbon Dating to the Geochronology of the Peopling of the New World. In *Radiocarbon After Four Decades: An Interdisciplinary Perspective*, edited by R. E. Taylor, pp. 355-374. Springer-Verlag, New York.

Heiken, Grant H.

1972 *Tuff Rings of the Fort Rock - Christmas Lake Valley Basin, South-Central Oregon*. Unpublished Ph.D. Dissertation, University of California, Santa Barbara, California.

Heizer, Robert F.

1942 Walla Walla Indian Expeditions to the Sacramento Valley. *California Historical Society Quarterly* 21:1-7.

Heizer Robert F. and Thomas R. Hester

1978 *Great Basin Projectile Points: Forms and Chronology*. Ballena Press Publications in Archaeology, Ethnology and History 10.

Heizer, Robert F. and Alex D. Krieger

1956 The Archaeology of Humboldt Cave, Churchill County, Nevada. *University of California Publications in American Archaeology and Ethnology* 47(1):1-190. Berkeley.

Heizer, Robert F. and Lewis K. Napton

1970 *Archaeological Investigations in Lovelock Cave, Nevada*. University of California Archaeological Research Facility Contributions 10. Berkeley.

Helzer, Margaret M.

2001 *Paleoethnobotany and Household Archaeology at the Bergen Site: A Middle Holocene Occupation in the Fort Rock Basin, Oregon*. Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.

2003 Redmond Caves Archaeological Project An Interim Report: Spring 2003. State Museum of Anthropology, University of Oregon. Eugene.

Hemphill, Brian E.

1999 Wear and Tear: Osteoarthritis as an Indicator of Mobility among Great Basin Hunter-Gatherers. In *Prehistoric Lifeways in the Great Basin Wetlands: Bioarchaeological Reconstruction and Interpretation*, edited by Brian E. Hemphill and Clark S. Larsen, pp. 241-289. University of Utah Press, Salt Lake City.

Hemphill, Brian E. and Clark S. Larsen

1999 *Prehistoric Lifeways in the Great Basin Wetlands: Bioarchaeological Reconstruction and Interpretation*. University of Utah Press, Salt Lake City.

Hemphill, Claudia B.

1990 Test Excavations at the Winchuck Site (35CU176), 1989. Report to the Siskiyou National Forest on file at the Oregon State Museum of Anthropology, University of Oregon, Eugene, Oregon.

Hibbs, Charles H., Brian L. Gannon, and C. H. Willard

1976 Lower Deschutes River Cultural Resources Survey: Warm Springs Bridge to Macks Canyon, Sherman, Wasco, and Jefferson Counties. Report on file with Prineville District BLM, Prineville, Oregon.

Hirschboeck, K. K.

1991 Climates and Floods. National Water Summary 1988-89 – Floods and Droughts: Hydrologic Perspectives on Water Issues. *US Geological Survey Water Supply Paper* 2375:65-88.

Hitchcock, C. Leo and Arthur Cronquist

1973 *Flora of the Pacific Northwest: An Illustrated Manual*. University of Washington Press. Seattle.

Hodder, Ian

1982 Toward a Contextual Approach to Prehistoric Exchange. In *Contexts for Prehistoric Exchange*, edited by Jonathon E. Ericson and Timothy K. Earle, pp. 199-212. Academic Press, New York.

Hoffman, C. C.

1996 *Testing the Western Pluvial Lakes Tradition*

Hypothesis: Early Holocene Mobility and Land Use in the Northwestern Great Basin. Master's Thesis, University of Nevada.

Hofman, Jack L.
1986 Vertical Movement of Artifacts in Alluvial and Stratified Deposits. *Current Anthropology* 27(2):163-171.

Hofman, Jack L., Daniel S. Amick, and Richard O. Rose
1990 Shifting Sands: A Folsom-Midland Assemblage from a Campsite in Western Texas. *Plains Anthropologist* 35(129):221-253.

Hofman, Jack L., and Don G. Wycoff
1991 Clovis Occupation in Oklahoma. *Current Research in the Pleistocene* 8:29-32.

Holliday, V.T.
2000 Folsom Drought and Episodic Drying on the Southern High Plains from 10,900-10,200 Yr. BP. *Quaternary Research* 53:1-12.

Holmer, Richard N.
1986 Common Projectile Points of the Intermountain West. In *Anthropology of the Desert West. Essays in Honor of Jesse D. Jennings*, edited by C. J. Condie and Don D. Fowler, pp. 89-115. University of Utah Anthropological Papers 110, Salt Lake City.

Hostetler, S. W., and F. Giorgi
1992 Use of a Regional Atmospheric Model to Simulate Lake-atmosphere Feedbacks Associated with Pleistocene Lakes Lahontan and Bonneville. *Climate Dynamics* 7:39-44.

Hostetler, S. W., F. Giorgi, G. T. Bates, and P. J. Bartlein
1994 Lake-atmosphere Feedbacks Associated with Paleolakes Bonneville and Lahontan. *Science* 263:665-668.

Houghton, J. G.
1969 *Characteristics of Rainfall in the Great Basin*. Ph.D. Dissertation, Department of Geography, University of Oregon, Eugene.

Howard, C. D.
1990 The Clovis Point: Characteristics and Type Description. *Plains Anthropologist* 35(129):255-262.

Howe, Carrol B.
1968 *Ancient Tribes of the Klamath Country*. Binfords and Mort, Portland, Oregon.

Hubbs C. L., and R. R. Miller
1948 The Great Basin, with Emphasis on Glacial and Post-glacial Times: The Zoological Evidence: Correlation Between Fish Distribution and Hydrographic History in the Desert Basins of Western United States. *Bulletin of the University of Utah* 38:17-167.

Huckleberry, G. A., C. Beck, G. T. Jones, A. M. Holmes, M. D. Cannon, S. D. Livingston. and J. M. Broughton
2001 Terminal Pleistocene/Early Holocene Environmental Change at the Sunshine Locality, North-Central Nevada, U. S. A. *Quaternary Research* 55:303-312.

Hughes, Richard E.
1978 Aspects of Prehistoric Wiyot Exchange and Social Ranking. *Journal of California Anthropology* 5:53-66.
1986 *Diachronic Variability in Obsidian Procurement Patterns in Northeastern California and Southcentral Oregon*. University of California Publications in Anthropology 17, Berkeley, California.
1990 The Gold Hill Site: Evidence for a Prehistoric Socioceremonial System in Southwestern Oregon. In *Living With the Land: The Indians of Southwest Oregon*, edited by Nan Hannon and Richard K. Olmo, pp. 48-55. Southern Oregon Historical Society, Medford, Oregon.
1993 Appendix F: X-Ray Fluorescence Data. In *The Archaeology of Buffalo Flat: Cultural Resources Investigations for the CONUS OTH-B Buffalo Flat Radar Transmitter Site, Christmas Valley, Oregon*, by Albert C. Oetting, pp. 777-828. Report prepared for the U. S. Army Corps of Engineers, Seattle, Washington. Heritage Research Associates Report No. 151, Eugene, Oregon.
1995 X-ray fluorescence study of obsidian (N=50) from the Bowling Dune and DJ Ranch sites, Fort Rock Basin, Oregon. Geochemical Research Laboratory, Letter Report 94-108. On file Museum of Anthropology, University of Oregon, Eugene.
1999 Appendix B: Trace Element Concentrations of Obsidian Artifacts. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*, by Thomas J. Connolly, pp. 259-271. University of Utah Anthropological Papers 121. Salt Lake City.

Hughes, Richard E. and R. L. Bettinger
1984 Obsidian and Prehistoric Cultural Systems in California. In *Exploring the Limits: Frontiers and Boundaries in Prehistory*, edited by Suzanne P. DeAtley and Frank J. Findlow, pp. 153-172. BAR International Series 223, Oxford, England.

Hughes, Richard E. and James A. Bennyhoff
1986 Early Trade. In *Handbook of North American Indians*: Vol. 11, *Great Basin*, edited by Warren L. d'Azevedo pp. 238-255. Smithsonian Institution, Washington D.C.

Hunn, Eugene S.
1990 *Nch'i-Wana: "The Big River:" Mid-Columbia Indians and Their Land*. University of Washington Press, Seattle.

Hunn, Eugene S. and David H. French
1981 Lomatium: A Key Resource for Columbia Plateau Native Subsistence. *Northwest Science* 55(2):87-94.

Hutchinson, Phillip W.
1988 The Prehistoric Lake Dwellers at Lake Hubbs. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 303-318. Nevada State Museum Anthropological Papers No. 21, Carson City.

Jenkins, Paul C. and Thomas E. Churchill
1989 Archaeological Investigations of the Dry Creek site, 35DO401. Report by Coastal Magnetic Search & Survey, Salem, Oregon, on file at the Umpqua National Forest.

Jenkins, Dennis L.

1992 Cultural Resources Survey of the Oil Dri (Section D) Mining Claim in Fort Rock Basin, Lake County, Oregon. Letter report to Lakeview District Office of Bureau of Land Management.

1994a Settlement-Subsistence Patterns in the Fort Rock Basin: A Cultural-Ecological Perspective on Human Responses to Fluctuating Wetlands Resources of the Last 5000 Years. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 599-628. University of Oregon Anthropological Papers 50. Eugene.

1994b Report of the University of Oregon Field School Archaeological Excavations in the Fort Rock Valley, 1993. Report to Lakeview District Bureau of Land Management, Lakeview, Oregon.

1994c Archaeological Investigations at Three Wetlands Sites in the Silver Lake Area of the Fort Rock Basin. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 213-258. University of Oregon Anthropological Papers 50. Eugene.

1995 Report of the 1995 University of Oregon Field School Archaeological Test Excavations at Locality III, GP-1, GP-2, GP-3, and the Sage Sites in the Fort Rock Basin, Central Oregon. Report to Lakeview District, Bureau of Land Management.

2000 Early to Middle Holocene Cultural Transitions in the Northern Great Basin of Oregon: The View From Fort Rock. In *Archaeological Passages: A Volume in Honor of Claude Nelson Warren*, edited by Joan S. Schneider, Robert M. Yohe II, and Jill Gardner, pp. 69-109. Publications in Archaeology Volume 1. Western Center for Archaeology and Paleontology, Hemet, California.

Jenkins, Dennis L. and C. Melvin Aikens

1994 Paulina Marsh Archaeological Survey. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 259-281. University of Oregon Anthropological Papers 50. Eugene.

Jenkins, Dennis L., C. Melvin Aikens, and William Cannon

1999 University of Oregon Archaeological Field School, Northern Great Basin Prehistory Project Research Design. Department of Anthropology/Museum of Natural History, University of Oregon.

2000 University of Oregon Archaeological Field School, Northern Great Basin Prehistory Project Research Design. Department of Anthropology/Museum of Natural History, University of Oregon.

2002 Reinvestigation of the Connley Caves (35LK50): A Pivotal Early Holocene Site in the Fort Rock Basin of South-Central Oregon. Research design and cooperative agreement proposal between the Bureau of Land Management and University of Oregon. Museum of Natural History, University of Oregon. Eugene.

Jenkins, Dennis L. and Ann Brashear

1994 Excavations at Four Habitation Sites in the Boulder Village Uplands: A Preliminary Report. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*., edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 431-484. University of Oregon Anthropological Papers 50. Eugene.

Jenkins, Dennis L. and Thomas J. Connolly

1994 *Archaeological Excavations at the Paquet Gulch Bridge Site: A Pithouse Village in the Deschutes River Basin, Southwestern Columbia Plateau, Oregon*. University of Oregon Anthropological Papers 49. Eugene.

1996 *Mid-Holocene Occupations at the Heath Cliffs Site, Warm Springs, Oregon.* University of Oregon Anthropological Papers 53. Eugene.

2000 Project Summary and Conclusions. In Human Adaptations in Drews Valley: A Mid-Elevation Setting on the Northern Great Basin Periphery, South-Central Oregon, edited by Dennis L. Jenkins, pp. 335-376. Report 2000-3, State Museum of Anthropology. University of Oregon, Eugene.

Jenkins, Dennis L. and Jon M. Erlandson

1996 *Olivella* Grooved Rectangle Beads from a Middle Holocene Site in the Fort Rock Valley, Northern Great Basin. *Journal of California and Great Basin Anthropology* 18(2):296-302.

Jenkins, Dennis L., Margaret M. Helzer, Leah L. Largaespada, and Patrick O'Grady

2000 Middle Holocene Adaptations on the Northwestern Great Basin/Southwestern Plateau Interface: Subsistence, Trade, and Social Organization in the Fort Rock Region of Central Oregon. Paper presented at the Northwest Anthropological Conference.

Jenkins, Dennis L., Guy Prouty, Patricia McDowell, and Vivien Singer

1994 Exploratory Excavations at Nine Archaeological Sites on Mining Claims C and D of the Oil Dri Corporation, Fort Rock Valley, Central Oregon. Report to Oil Dri Corporation, Christmas Valley, Oregon, and Bureau of Land Management, Lakeview District, Lakeview, Oregon. Museum of Anthropology, University of Oregon. Eugene.

Jenkins, Dennis L., Craig E. Skinner, Jennifer J. Thatcher, and Keenan Hoar

1999 Obsidian Characterization and Hydration Results of the Fort Rock Basin Prehistory Project. Paper presented at the 52nd Northwest Anthropological Conference, Newport, Oregon.

Jenkins, Dennis L. and Nina Wimmers

1994 Beads as Indicators of Cultural and Chronological Change in the Fort Rock Basin. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 107-124. University of Oregon Anthropological Papers 50. Eugene.

Jennings, Jesse D.

1957 *Danger Cave*. University of Utah Anthropological Papers 27. Salt Lake City.

1964 The Desert West. In *Prehistoric Man in the New World*, edited by Jesse D. Jennings and Edward Norbeck, pp. 149-174. University of Chicago.

Jennings, Jesse D., Alan R. Schroedl, and Richard N. Holmer
1980 *Sudden Shelter*. University of Utah Anthropological Papers 103. Salt Lake City.

Johnson, Gregory A.
1982 Organizational Structure and Scalar Stress. In *Theory and Explanation in Archaeology*, edited by C. Renfrew, M. J. Rowlands, and B. A. Segraves, pp. 389-422. Academic Press, New York.

Jones, George T., C. Beck, E. E. Jones, and R. E. Hughes
2003 Lithic Source Use and Paleoarchaic Foraging Territories in the Great Basin. *American Antiquity* 68:5-38.

Judge, W. James
1973 *Paleoindian Occupation of the Central Rio Grande Valley in New Mexico.* University of New Mexico Press, Albuquerque.

Jung, S.
1998 Appendix A: Faunal Analysis. In *Further Archaeological Investigations in Dietz Basin, Lake County, Oregon: The Results of the 1996 Field Season*, edited by Arianne O. Pinson, pp. A-1 - A-12. Sundance Archaeological Research Fund Technical Paper No. 4. University of Nevada, Reno.

Kay, Paul A.
1989 A Perspective on Great Basin Paleoclimates. In *Man and the Environment in the Great Basin*, edited by David B. Madsen and James F. O'Connell, pp. 76-81. Society for American Archeology Papers, No. 2, Washington, D.C.

Keepax, Carole
1977 Contamination of Archaeological Deposits by Seeds of Modern Origin with Particular Reference to the Use of Flotation Machines. *Journal of Archaeological Science* 4:221-229.

Kelly, Isabel T.
1932 Ethnography of the Surprise Valley Paiute. *University of California Publications in American Archaeology and Ethnology* 31(1):67-210. Berkeley.

Kelly, Robert L.
1983 Hunter-Gatherer Mobility Strategies. *Journal of Anthropological Research* 39:177-306.
1992 Mobility/Sedentism: Concepts, Archaeological Measures, and Effects. *Annual Review of Anthropology* 21:43-66.
1995 *The Foraging Spectrum: Diversity in Hunter-Gatherer Lifeways*. Smithsonian Institution Press, Washington.

Keyser, James D. and Vance Carlson
1983 Boundary Determination for the Medicine Creek Site (35DO161). Report on file at the Umpqua National Forest, Roseburg, Oregon.

King, Chester D.
1974 The Explanation of Differences and Similarities among Beads Used in Prehistoric and Early Historic California. In *?Antap: California Indian Political and Economic Organization*, edited by L. J. Bean and T. F. King, pp. 75-92. Anthropological Papers 2, Ballena Press. Ramona, California.
1990 Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region before A.D. 1804. In *The Evolution of North American Indians: A 31-volume Series of Outstanding Dissertations*. Garland Publishing, New York.

Kirk, Donald R.
1975 W*ild Edible Plants of Western North America.* Naturegraph Publishers, Inc. Happy Camp, California.

Kistler, R., E. Kalnay, W. Collins, S. Saha, G. White, J. Woollen, M. Chelliah, W. Ebisuzaki, M. Kanamitsu, V. Kousky, H. Van den Dool, R. Jenne, M. Fiorino
2001 The NCEP-NCAR 50-year reanalysis: monthly means CD-ROM and documentation. *Bulletin of the American Meteorological Society* 82: 247-267.

Koehler, P. A., and R. S. Anderson
1995 Thirty Thousand Years of Vegetation Changes in the Alabama Hills, Owens Valley, California. *Quaternary Research* 43:238-248.

Krieger, Alex D.
1944 Review of Archaeological Researches in the Northern Great Basin, by L S. Cressman, Frank C. Baker, Paul S. Conger, Henry P. Hanson, and Robert F. Heizer. *American Antiquity* 9: 351-359.

Kutzbach, J. E., and T. Webb III
1998 An Introduction to 'Late Quaternary Climates: Data Syntheses and Model Experiments. *Quaternary Science Reviews* 17:465-471.

LaMarche, V. C., Jr.
1973 Holocene Climatic Variations Inferred from Treeline Fluctuations in the White Mountains, California. *Quaternary Research* 3:632-660.

LaMarche, V. C., Jr. and H. A. Mooney
1967 Altithermal Timberline Advance in Western United States. *Nature* 213:980-982.

Largaespaeda, Leah L.
2001 From Sand and Sea: A Chronology and Typology of Marine Shell from Archaeological Sites in the Fort Rock Basin, Central Oregon. Master's Thesis, Department of Anthropology, University of Oregon, Eugene.

Layton, Thomas N.
1972a Lithic Chronology in the Fort Rock Valley, Oregon. *Tebiwa* 15(2):1-21.
1972b A 12,000 Year Obsidian Hydration Record of Occupation, Abandonment and Lithic Change from the Northwestern Great Basin. *Tebiwa* 15(2):22-28.
1979 Archaeology and Paleo-Ecology of Pluvial lake Parman, Northwestern Great Basin. *Journal of New World Archaeology* 3(3):41-56.
1981 Traders and Raiders: Aspects of Trans-Basin and California-Plateau Commerce, 1800-1830. *Journal of California and Great Basin Anthropology* 3(1):127-137.

Lee, D. S., C. R. Gilbert, C. H. Hocutt, R. E. Jenkins, D. E. McAllister, and J. R. Stauffer, Jr.
1980 *Atlas of North American Freshwater Fishes.* North Carolina State Museum of Natural History.

Leney, Lawrence and Richard W. Casteel
1975 Simplified Procedure for Examining Charcoal

Specimens for Identification. *Journal of Archaeological Science* 2(2):153-159.

Leonard, R. D. and George T. Jones, editors
1989 *Quantifying Diversity in Archaeology*. Cambridge University Press, Cambridge, Massachusetts.

Leonard, E. M. and M. A. Reasoner
1999 A Continuous Holocene Glacial Record Inferred from Proglacial Lake Sediments in Banff National Park, Alberta, Canada. *Quaternary Research* 51:1-13.

Leonhardy, Frank C. and David G. Rice
1970 A Proposed Culture Typology for the Lower Snake River Region. *Northwest Anthropological Research Notes* 4(1):1-29.

Libby, W. F.
1952 *Radiocarbon Dating*. University of Chicago Press.

Licciardi, J. M.
2001 Chronology of Latest Pleistocene Lake-Level Fluctuations in the Pluvial Lake Chewaucan Basin, Oregon, USA. *Journal of Quaternary Science* 16(6):545-554.

Littlefield, Carroll D.
1990 *Birds of the Malheur National Wildlife Refuge, Oregon.* Oregon State University Press.

Livingston, Stephanie
1995 Letter report to Dennis L. Jenkins, dated January 3. On file at the Museum of Anthropology, University of Oregon, Eugene.

Long, A. and B. Rippeteau
1974 Testing Contemporaneity and Averaging Radio-carbon Dates. *American Antiquity* 39(2):205-215.

Loud, Llewellyn L. and Mark R. Harrington
1929 Lovelock Cave. *University of California Publications in American Archaeology and Ethnology* 25(1):1-183. Berkeley.

Lowie, Robert H.
1924 Notes on Shoshonean Ethnography. *Anthropological Papers of the American Museum of Natural History* 20(3):185-314. New York.

Lyman, R. Lee
1987 Archaeofaunas and Butchery Studies: A Taphonomic Perspective. *Advances in Archaeological Methods and Theory* 1:249-335.
1991 *Prehistory of the Oregon Coast*. Academic Press, New York.

Macko, Michael E.
1998 Executive Summary of Mitication Measures Implemented Pursuant to the Operation Plan and Research Design for the Proposed Newporter North Residential Development, edited by Michael E. Macko. Macko, Inc. Huntington Beach, California.

MacLeod, Norman S., David R. Sherrod, Lawrence A. Chitwood, and Robert A. Jensen
1995 *Geologic Map of Newberry Volcano, Deschutes, Klamath, and Lake Counties, Oregon*. U. S. Geological Survey Miscellaneous Investigations Series I-2455, scale 1:62,500 and 1:24,000.

Madsen, David B. and David Rhode
1990 Early Holocene Pinyon (*Pinus monophylla*) in the Northeastern Great Basin. *Quaternary Research* 33:94-101.

Mahar, James Michael
1954 *Ethnobotany of the Oregon Paiutes of the Warm Springs Indian Reservation*. B.A. thesis, Reed College, Portland.

Malville, Nancy J.
2001 Long-Distance Transport of Bulk Goods in the Pre-Hispanic American Southwest. *Journal of Anthropological Archaeology* 20:230-243.

Martin, Alexander C., and William D. Barkley
1961 *Seed Identification Manual*. University of California Press, Berkeley and Los Angeles.

Maser, Chris, B. R. Mate, J. F. Franklin, and C. T. Dryness
1981 *Natural History of Oregon Coast Mammals.* Special Publication of the Museum of Natural History, University of Oregon, Eugene.

McConnaughey, B. H. and McConnaughey, E.
1985 *Pacific Coast. National Audubon Society Nature Guides*. Alfred A. Knopf, Inc., New York.

McDowell, Patricia F. and Harrison, S. P.
1993 Environmental Controls on the Distribution of Lunettes in the Western U.S.A. Manuscript in possession of authors.

Mehringer, Peter J. Jr.,
1985 Late-Quaternary Pollen Records from the Interior Pacific Northwest and Northern Great Basin of the United States. In *Pollen Records of Late-Quaternary North American Sediments*, edited by V.M. Bryant, Jr. and R.G. Holloway, pp.167-189. American Association of Stratigraphic Palynologists Foundation, Dallas, Texas.

Mehringer, Peter J. and William J. Cannon
1994 Volcaniclastic Dunes of the Fort Rock Valley, Oregon: Stratigraphy, Chronology, and Archaeology. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 283-328. University of Oregon Anthropological Papers 50. Eugene.

Mehringer, Peter J., Jr. and Peter E. Wigand
1986 Holocene history of Skull Creek dunes, Catlow Valley, southeastern Oregon, USA. *Journal of Arid Environments* 11:117-138.

Meighan, Clement W.
1992 Obsidian and 'Exchange Systems'. *International Association for Obsidian Studies Bulletin* 6:3.

Meltzer, David J.
1988 Late Pleistocene Human Adaptations in Eastern North America. *Journal of World Prehistory* 2:1-52.
1989 Was Stone Exchanged Among Eastern North American Paleoindians? In *Eastern Paleoindian Lithic Resource Use*, edited by C. J. Ellis and J. C. Lothrop, pp. 11-39. Westview Press, San Francisco.
1999 Human Responses to Middle Holocene (Altithermal) Climates on the North American Great Plains. *Quaternary Research* 52:404-416.

Meltzer, David J., and M. R. Bever
1995 *Paleoindians of Texas: An Update on the Texas Clovis Fluted Point Survey*. Bulletin of the Texas Archaeological Society 66.

Mensing, S. A.
2001 Late-Glacial and Early Holocene Vegetation and Climate Change near Owens Lake, Eastern California. *Quaternary Research* 55:57-65.

Minnis, Paul E.
1981 Seeds in Archaeological Sites: Sources and Some Interpretive Problems. *American Antiquity* 48(1):143-152.
1987 Identification of Wood from Archaeological Sites in the American Southwest. I. Key for Gymnosperms. *Journal of Archaeological Sciences* 14(2):347-366.

Minor, Rick
1985 Paleo-Indians in Western Oregon: A Description of Two Fluted Projectile Points. *Northwest Anthropological Research Notes* 19:1:33-40.

Minor, Rick and Lee Spencer
1977 Site of a Probable Camelid Kill at Fossil Lake, Oregon: An Archaeological Evaluation. Report of the Department of Anthropology, University of Oregon, Eugene, to the Bureau of Land Management, Lakeview District, Lakeview, Oregon.

Minor, Rick, Stephen D. Beckham, and Kathryn A. Toepel
1979 *Cultural Resource Overview of the BLM Lakeview District, South-Central Oregon: Archaeology, Ethnography, History*. University of Oregon Anthropological Papers 16. Eugene.

Minor, Rick and Kathryn A. Toepel
1986 The Archaeology of the Tahkenitch Landing Site: Early Prehistoric Occupation on the Oregon Coast. Report to the Siuslaw National Forest by Heritage Research Associates, Eugene, Oregon.

Mitchell, V. L.
1976 The Regionalization of Climate in the Western United States. *Journal of Applied Meteorology* 15:920-927.

Mix, A. C., D. C. Lund, N. G. Pisias, P. Boden, Lbornmalm, M. Lyle, and J. Pike
1999 Rapid Climate Oscillations in the Northeast Pacific During the Last Deglacialtion Reflect Nourthern and Southern Hemisphere Sources. In *Mechanisms of Global Climate Change at Millennial Time Scales*, edited by P. U. Clark, R. S. Webb, and L. D. Keigwin, pp. 127-14. American Geophysical Union, 8. Washington, D.C.

Mock, C. J.
1994 *Modern Climate Analogues of Late-Quaternary Paleoclimates for the Western United States*. Ph.D. dissertation, Department of Geography, University of Oregon, Eugene.
1996 Climatic Controls and Spatial Variations of Precipitation in the Western United States. *Journal of Climate* 9:1111-1125.

Moessner, Jean
1995 DJ Ranch: An Investigation of a Mid- to Late-Holocene Occupation Site in Fort Rock Valley, South-Central Oregon. M. S. thesis, Department of Anthropology, University of Oregon, Eugene.

Moreman, Daniel E.
1986 *Medicinal Plants of Native America*. University of Michigan Museum of Anthropology Technical Report #19. Ann Arbor.

Morris, Percy A.
1980 *A Field Guide to Pacific Coast Shells*. Houghton Mifflin company, Boston.

Morrison, R. B.
1991 Quaternary Stratigraphic, Hydrologic, and Climatic History of the Great Basin, with Emphasis on Lakes Lahontan, Bonneville, and Tecopa. In *Quaternary Nonglacial Geology: Conterminous U.S. Geology of North America K-2*, edited by R. B. Morrison, pp. 283-320. Geological Society of America, Boulder, Colorado.

Moyle, Peter B.
1976 *Inland Fishes of California*. University of California Press. Berkeley:

Mueller, Emily J.
2001 A Jackrabbit Dinner Mystery: Zooarchaeological Analysis of a Middle Holocene Site from Southcentral Oregon. Senior Research Paper, Department of Anthropology, University of Oregon, Eugene.

Musil, Robert R.
1984 Ashes to Ashes, Windust to Dust: a Windust Site in the Northern Great Basin. Paper presented at the 19th Great Basin Anthropological Conference, Boise, Idaho.
1992 Testing and Evaluation of the Susan Creek Campground Site, Douglas County, Oregon. Report to the Roseburg District Bureau of Land Management by Heritage Research Associates, Eugene, Oregon.
1994 The Archaeology of the Susan Creek Campground. Report to the Roseburg District Bureau of Land Management by Heritage Research Associates, Eugene, Oregon.
1995 *Adaptive Transitions and Environmental Change in the Northern Great Basin: A View from Diamond Swamp*. University of Oregon Anthropological Papers 51. Eugene.
1997 The Archaeology of Susan Creek Campground: The Passport in Time Project. Report to the Roseburg District Bureau of Land Management by Heritage Research Associates, Eugene, Oregon

Musil, Robert R. and Brian L. O'Neill
1997 Source and Distribution of Archaeological Obsidian in the Umpqua River Basin of Southwest Oregon. In *Contributions to the Archaeology of Oregon: 1995-1996*, edited by Albert C. Oetting, pp. 123-162. Association of Oregon Archaeologists Occasional Papers 6. Eugene.

Myer, William E.
1928 *Indian Trails of the Southeast*. Bureau of American Ethnology 42nd Annual Report, pp. 727-857.

Napton, L. K. and R. F. Heizer
1970 Analysis of Human Coprolites from Archaeological Contexts, with Primary Reference to Lovelock Cave, Nevada. In *Archaeology and Prehistoric Great Basin Lacustrine Subsistence Regime as Seen from Lovelock Cave, Nevada*, edited by R. F. Heizer and L. K. Napton, pp. 87-130.

Contributions of the University of California Archaeological Research Facility, Berkeley.

Newman, Thomas M.

1965 Cascadia Cave. Report to the National Park Service by the Department of Anthropology, Portland State College, Portland, Oregon.

Nials, Fred L.

1999 *Geomorphic Systems and Stratigraphy in Internally-Drained Watersheds of the Northern Great Basin: Implications for Archaeological Studies*. University of Nevada, Reno, Department of Anthropology, Sundance Archaeological Research Fund Technical Paper No. 5.

Northwest Research Obsidian Laboratory (NROL)

2002 Oregon Obsidian Sources. http://www.obsidianlab.com/sourcecatalog/s_or.html

2003a Northwest Research Obsidian Studies Laboratory website (www.obsidianlab.com).

2003b United States Obsidian Source Catalog website (www.sourcecatalog.com).

Nowak, C. L., R. S. Nowak, R. J. Tausch, P. E. Wigand

1994a A 30,000 Year Record of Vegetation Dynamics at a Semi-arid Locale in the Great Basin. *Journal of Vegetation Science* 5:579-590.

1994b Tree and Shrub Dynamics in Northwestern Great Basin Woodland and Shrub Steppe during the Late-Pleistocene and Holocene. *American Journal of Botany* 81:265-277.

Oetting, Albert C.

1989 *Villages and Wetlands Adaptations in the Northern Great Basin: Chronology and Land Use in the Lake Abert - Chewaucan Marsh Basin, Lake County, Oregon*. University of Oregon Anthropological Papers 41. Eugene.

1990a Aboriginal Settlement in the Lake Abert-Chewaucan Marsh Basin, Lake Couonty, Oregon. In *Wetlands Adaptations in the Great Basin*,edited by Joel Janetski and David B. Madsen, pp. 183-206. Museum of Peoples and Cultures Occasional Papers No. 1. Brigham Young University, Provo, Utah.

1990b *The Malheur Lake Survey: Lacustrine Archaeology in the Harney Basin, Central Oregon*. Heritage Research Associates Reports No. 96. Eugene, Oregon.

1993 *The Archaeology of Buffalo Flat: Cultural Resources Investigations for the CONUS OTH-B Buffalo Flat Radar Transmitter Site, Christmas Lake Valley, Oregon*. Heritage Research Associates Report No. 151, Eugene, Oregon.

1994a Early Holocene Rabbit Drives and Prehistoric Land Use Patterns on Buffalo Flat, Christmas Lake Valley, Oregon. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 155-170. University of Oregon Anthropological Papers 50, Eugene.

1994b Chronology and Time Markers in the Northwestern Great Basin: The Chewaucan Basin Cultural Chronology. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*, edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 41-62. University of Oregon Anthropological Papers 50,.Eugene.

1996 Patterns of Obsidian Use on Buffalo Flat, Christmas Lake Valley, Oregon. Paper presented at the 25th Great Basin Anthropological Conference.

1999 An Examination of Wetland Adaptive Strategies in Harney Basin: Comparing Ethnographic Paradigms and the Archaeological Record. In *Prehistoric Lifeways in the Great Basin Wetlands: Bioarchaeological Reconstruction and Interpretation*, edited by Brian E. Hemphill and Clark S. Larsen, pp. 203-218. University of Utah Press, Salt Lake City.

O'Grady, Patrick

1996 Faunal analysis of the East Block, Locality III 35LK3035. Manuscript in possession of author.

1999 Human Occupation Patterns in the Uplands: An Analysis of Sourced Obsidian Projectile Points from Playa Villages in the Fort Rock Uplands, Lake County, Oregon. M. S. Thesis, Department of Anthropology, University of Oregon.

2000a Suspended in Time: A 5000 Year-old Butchering Site in South-central Oregon. Paper Presented at the Twenty-Seventh Great Basin Anthropological Conference, Ogden, Utah.

2000b Zooarchaeological Analysis of Vertebrate and Invertebrate Remains from Gravelly Ford Bridge. In The Chewaucan River Bridges Project: Archaeological Investigations at Three Localities in the Lower Chewaucan Marsh Along the La Pine-Valley Falls Highway (OR31), Lake County, Oregon., by Brian L. O'Neill, D. L. Jenkins, C. M. Hodges, P. O'Grady, and T. J. Connolly. Oregon State Museum of Anthro-pology Report 2000-4, University of Oregon, Eugene.

O'Neill, Brian L.

1989 Archaeological Investigations at the Grubbe Ranch Site (35DO395), Douglas County, Oregon. *Oregon State Museum of Anthropology Report* 89-1, University of Oregon, Eugene.

1991 Evaluation of Six Archaeological Sites Along the North Umpqua Highway, Douglas County: Steamboat Creek to Boulder Flat Section. *Oregon State Museum of Anthropology Report* 91-1, University of Oregon, Eugene, Oregon.

1992 Pre-Mazama Occupation of the Dry Creek Site (35DO401), Southwest Oregon. Paper presented at the 45th Annual Northwest Anthropological Conference, Burnaby, British Columbia.

1995 Archaeological Investigations at Five Sites (35DO621, 35DO624, 35DO642, 35DO643, 35DO645) in the North Umpqua Hydroelectric Project, Douglas County, Oregon. *Oregon State Museum of Anthropology Report* 95-3, University of Oregon, Eugene.

1996 The Medicine Bridge Site (35DO672): Archaeological Investigatins at PP&L's Proposed Soda Springs Sediment Placement Project, Douglas County, Oregon. *Oregon State Museum of Anthropology Report* 96-1, University of Oregon, Eugene.

O'Neill, Brian L. and Gary Bowyer
1995 Reconnaissance and Historic Site Evaluation Along the Exposed Shoreline of Lemolo Lake, Douglas County, Oregon. *Oregon State Museum of Anthropology Report* 95-9, University of Oregon, Eugene.

O'Neill, Brian L., Thomas J. Connolly, and Dorothy Freidel
1999 The Long Tom and Chalker Sites: A Holocene Geoarchaeological Record for the Upper Willamette Valley. *Oregon State Museum of Anthropology Report* 99-6, University of Oregon, Eugene.

O'Neill, Brian L., Vivien Singer, Melissa Cole-Darby, and Laura C. White
1996 Archaeology of the Dry Creek Site (35DO401). *In* Streamside Occupations in the North Umpqua River Drainage Before and After the Eruption of Mount Mazama, by Brian L. O'Neill, Thomas J. Connolly, and Dorothy E. Freidel, pp 217-333. *Oregon State Museum of Anthropology Report* 96-2, University of Oregon, Eugene.

O'Neill, Brian L. and Laura C. White
1994 Cultural Resource Inventory of the North Umpqua Hydroelectric Project, Douglas County, Oregon. *Oregon State Museum of Anthropology Report* No. 94-2, University of Oregon, Eugene, Oregon.

O'Neill, Brian L., Laura C. White, and Mike Droz
1996 Archaeology of the Lough Terrace Site (35DO641). *In* Streamside Occupations in the North Umpqua River Drainage Before and After the Eruption of Mount Mazama, by Brian L. O'Neill, Thomas J. Connolly, and Dorothy E. Freidel, pp 167-215. *Oregon State Museum of Anthropology Report* 96-2, University of Oregon, Eugene.

Osborn, G., and K. Bevis
2001 Glaciation in the Great Basin of the Western United States. *Quaternary Science Reviews* 20:1377-1410.

Oviatt, C. G.
1988 Late Pleistocene and Holocene Lake Fluctuations in the Sevier Lake Basin, Utah, USA. *Journal of Paleolimnology* 1:9-21.

Ozbun, Terry L. and John L. Fagan
1996 Archaeological Testing and Evaluation of the Seneca Clovis Site (35DO634). Report to the Roseburg District Bureau of Land Management by Archaeological Investigations Northwest, Portland, Oregon.

Paul-Mann, Teri
1994 Far View Butte: An Archaic Hunting, Gathering, and Vision Quest Site in the Silver Lake Valley, Oregon. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman*., edited by C. Melvin Aikens and Dennis L. Jenkins, pp. 329-348. University of Oregon Anthropological Papers 50. Eugene.

Pavesic, Max G.
1985 Cache Blades and Turkey Tails: Piecing Together the Western Idaho Archaic Burial Complex. In *Stone Tool Analysis: Essays in Honor of Don E. Crabtree*, edited by Mark G. Plew, James C. Woods, and Max G. Pavesic, pp. 55-89. University of New Mexico Press, Albuquerque.
1992 Death and Dying in the Western Idaho Archaic. In *Ancient Images, Ancient Thought: The Archaeology of Ideology*, edited by A. Sean Goldsmith, Sandra Garvie and David Selin, pp. 289-293. Department of Archaeology, University of Calgary.

Pearsall, Deborah M.
1983 Evaluating the Stability of Subsistence Strategies by Use of Paleoethnobotanical Data. *Journal of Ethnobiology* 3(2): 121-137.
1989 *Paleoethnobotany: A Handbook of Procedures*. Academic Press, San Diego, California.

Personius, Stephen F.
1993 *Age and Origin of Fluvial Terraces in the Central Coast Range, Western Oregon*. US Geological Survey Bulletin 2038, US Department of the Interior, United States Government Printing Office, Washington, D.C.

Peterson, Roger T.
1961 *A Field Guide to Western Birds, The Peterson Field Guide Series*. Houghton Mifflin Company, Boston.

Peterson, Jane, Douglas R. Mitchell, and M. Steven Shackley
1997 The Social and Economic Contexts of Lithic Procurement: Obsidian from Classic-Period Hohokam Sites. *American Antiquity* 62:231-259.

Pettigrew, Richard M.
1984 Prehistoric Land-use Patterns in the Alvord Basin. Southeastern Oregon. *Journal of California and Great Basin Anthropology* 6(1):61-90.
1985 *Archaeological Investigations on the East Shore of Lake Abert Lake County, Oregon, Volume 1*. University of Oregon Anthropological Papers 32. Eugene.

Pettigrew, Richard M., and Charles M. Hodges
1995 Prehistoric Hunter-Gatherer Land-Use Systems: Pacific Northwest. In Archaeological Investigations PGT-PG&E Pipeline Expansion Project Idaho, Washington, Oregon, and California, Michael J. Moratto, General Editor. Volume IV: Synthesis and Findings, edited by Randall F. Schalk, pp. 2-1 - 2-70. Pacific Gas Transmission Company, Portland, Oregon.

Pinson, Arianne O.
1996 Archaeological Investigations at the Dietz site (35LK1529), Lake County, Oregon, 1995. Sundance Archaeological Research Fund Report 2. University of Nevada, Reno.
1998 Subsistence and Settlement Patterns during the Pleistocene-Holocene Transition in the Northern Great Basin: The View from Dietz Basin. *Current Research in the Pleistocene* 15:60-62.
1999 *Foraging in Uncertain Times: The Effects of Risk on Subsistence Behavior During the Pleistocene-Holocene Transition in the Oregon Great Basin.* PhD. dissertation, University of New Mexico, Albuquerque. University Microfilms, Ann Arbor.

Plog, Fred T.
1977 Modeling Economic Exchange. In *Exchange Systems in Prehistory*, edited by Timothy. K. Earle and Jonathon E. Ericson, pp. 127-140. Academic Press, New York.

Popper, Virginia S.
1988 Selecting Quantitative Measurements in Paleoethnobotany. In *Current Paleoethnobotany: Analytical Methods and Cultural Interpretations of Archaeological Plant Remains*, edited by Christine A. Hastorf and Virginia S. Popper. The University of Chicago Press.

Porter, S. C., K. L. Pierce, and T. D. Hamilton
1983 Late Wisconsin Mountain Glaciation in the Western United States. In *Late Quaternary Environments of the United States, Vol. 1, The Late Pleistocene*, edited by S. C. Porter, pp. 71-111. University of Minnesota, Minneapolis.

Price, T. Douglas and James A. Brown
1985 *Prehistoric Hunter-Gatherers: The Emergence of Cultural Complexity*, edited by T. Douglas Price and James A. Brown. Academic Press, New York, New York.

Price, T. Douglas and Gary M. Feinman
1995 *Foundations of Social Inequality*. Plenum Press, New York and London.

Prouty, Guy L.
1994 Paleoethnobotanical Investigations of the Bowling Dune and the DJ Ranch Sites, Fort Rock Basin, Oregon. *In* Exploratory Excavations at Nine Archaeological Sites on Mining Claims C and D of the Oil Dri Corporation, Fort Rock Valley, Central Oregon, by Dennis L. Jenkins, Guy L. Prouty, Patricia McDowell, and Vivien Singer. Report to Lakeview District Bureau of Land Management, Lakeview, Oregon and Oil Dri Corporation, Christmas Valley, Oregon. Museum of Anthropology, University of Oregon, Eugene.
1995a *Roots and Tubers: Prehistoric Interrelationships Between Plants, Settlement and Subsistence Intensification, and Storage in the Fort Rock Basin, Northern Great Basin, Oregon*. Ph.D. dissertation, Department of Anthropology, University of Oregon, Eugene.
1995b Plants and Fort Rock Basin Prehistory: Paleoethno-botanical Investigations of the DJ Ranch and the Bowling Dune Sites. Report on file, State Museum of Anthropology, University of Oregon, Eugene.
1996 Plants and Fort Rock Basin Prehistory: Paleo-ethnobotanical Investigations at the Sage, Locality III, and GP-2 Sites. Report on file, State Museum of Anthropology, University of Oregon, Eugene.

Purdom, William B.
1964 The Geologic History of the Diamond Lake Area, Umpqua National Forest, Douglas County, Oregon. USDA Forest Service, and Douglas County Park Department, Roseburg, Oregon.

Pyke, C. B.
1972 *Some Meterological Aspects of the Seasonal Distribution of Precipitation in the Western United States*. University of California Water Resources Center, Contribution No. 139.

Quade, J., R. M. Forester, W. L. Pratt, and C. Carter
1998 Black Mats, Spring-fed Streams, and Late-Glacial-Age Recharge in the Southern Great Basin. *Quaternary Research* 49:129-148.

Raab, Mark L. and William J. Howard
2000 Modeling Cultural Connections between the Southern Channel Islands and the Western United States: The Middle Holocene Distribution of Olivella Grooved Rectangle Beads. *Proceedings of the Fifth California Channel Islands Symposium*, edited by D. Brown, K. Mitchell, and H. Chaney, pp. 590-597. Santa Barbara Museum of Natural History, California.

Raven, Christopher and Robert G. Elston
1993 *Land and Life at Malheur Lake: Preliminary Geomorphological and Archaeological Investigations*. Cultural Resource Series 8, U.S. Department of the Interior, Fish and Wildlife Service, Region 1. Portland, Oregon.

Ray, Verne F.
1963 *Primitive Pragmatists: The Modoc Indians of Northern California*. University of Washington Press, Seattle.

Rehder, Harald A.
1981 *The Audobon Society Field Guide to North American Seashells*. Alfred A. Knopf, Inc., New York.
1988 *The Audubon Society Field Guide to North American Seashells*. Alfred A. Knopf, Inc., New York.

Reid, Kenneth C.
1997 Gravels and Travels: A Comment on Andrefsky's "Cascade Phase Lithic Technology". *North American Archaeologist* 18:67-81.

Renfrew, Colin
1975 Trade as Action at a Distance: Questions of Integration and Communication. In *Ancient Civilization and Trade*, edited by Jeremy A. Sabloff and C. C. Lamberg-Karlovsky, pp. 3-59. University of New Mexico Press, Albuquerque.
1977 Alternative Models for Exchange and Spatial Distribution. In *Exchange Systems in Prehistory*, edited by Timothy K. Earle and Jonathon E. Ericson, pp. 71-90. Academic Press, New York.

Rice, David G.
1972 *The Windust Phase in Lower Snake River Region Prehistory*. Washington State University, Laboratory of Anthropology, Report of Investigations 50. Pullman.

Rice, Prudence M.
1987 Economic Change in the Lowland Maya Late Classic Period. In *Specialization, Exchange, and Complex Societies*, edited by E. M. Brumfiel and Timothy K. Earle, pp. 76-85. Cambridge University Press, Cambridge.

Ricks, Mary F. and William J. Cannon
1998 Rock Art as an Indicator of Early Upland Aggregation Sites in the Northern Great Basin. Paper presented at the 63rd Annual Meeting of the Society for American Archaeology, Seattle.

Ridings, Rosanna
1991 Obsidian Hydration Dating: The Effects of Mean Exponential Ground Temperature and Depth of Artifact Recovery. *Journal of Field Archaeology* 18:77-85.

1996 Where in the World does Obsidian Hydration Dating Work? *American Antiquity* 61(1):136-148.

Ross, Richard E.
1963 Prehistory of the Round Butte Area, Jefferson County, Oregon. M.A. thesis, Department of Anthropology, University of Oregon, Eugene.

Ross, Richard E.
1963 Prehistory of the Round Butte Area, Jefferson County, Oregon. Master's Thesis, Department of Anthropology, University of Oregon, Eugene.

Roth, Barbara J.
2000 Obsidian Source Characterization and Hunter-Gatherer Mobility: An Example from the Tucson Basin. *Journal of Archaeological Science* 27:305-314.

Rozaire, Charles E.
1963 Lake-Side Cultural Specializations in the Great Basin. *Nevada State Museum Anthropological Papers* 9:72-77.

Russell, Israel C.
1884 A Geological Reconnaissance in Southern Oregon. *U.S. Geological Survey Annual Report* 4: 431-464.

Sampson, C. Garth
1985 *Nightfire Island: Later Holocene Lake-Marsh Adaptation on the Western Edge of the Great Basin*. University of Oregon Anthropological Papers 33, Eugene.

Sappington, Robert L.
1981a A Progress Report on the Obsidian and Vitrophyre Sourcing Project. *Idaho Archaeologist* 4(4):4-17.
1981b Additional Obsidian and Vitrophyre Source Descriptions from Idaho and Adjacent Areas. *Idaho Archaeologist* 5(1):4-8.

Sappington, Robert L. and Kathryn A. Toepel
1981 X-Ray Fluorescence Analysis of Obsidian Samples. In *Survey and Testing of Cultural Resources Along the Proposed Bonneville Power Administration's Buckley-Summer Lake Transmission Line Corridor, Central Oregon*, by Kathryn A. Toepel and Stephen D. Beckham, pp. 235-263. Museum of Anthropology, University of Oregon, Eugene.

Schalk, Randal, R. G. Atwell, W. R. Hildebrandt, C. G. Lebow, P. Mikkelsen, and R. M. Pettigrew
1995 Mobility and Intensification. *In* Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California, Michael J. Moratto, General Editor. Volume IV: Synthesis of Findings, Randall F. Schalk, Volume Editor, pp. 9-1 to 9-44. Pacific Gas Transmission Company, Portland, Oregon.

Schmitz, J. T., and S. L. Mullen
1996 Water Vapor Transport Associated with the Summertime North American Monsoon as Depicted in ECMWF Analyses. *Journal of Climate* 9:1621-1634

Schneider, J. K.
1974 *Economic Man*. Free Press, New York.

Schreindorfer, Crystal S.
1985 Marial: 1984 Archaeological Investigations at 35CU84. Report to the Medford District Bureau of Land Management by the Department of Anthropology, Oregon State University, Corvallis.

Schulting, Rick J.
1995 *Mortuary Variability and Status Differentiation on the Columbia-Fraser Plateau*. Archaeology Press, Simon Fraser University. Burnaby, B.C.

Scott-Cummings, Linda
1995 Pollen Analysis at the DJ Ranch and Bowling Dune Sites, Fort Rock Basin, Oregon. PaleoResearch Labs Technical Report 94-75.
1999 Pollen and Phytolith Analysis. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands,* edited by Thomas J. Connolly, pp. 202-210. University of Utah Anthropological Papers 121. Salt Lake City.
2001 Stratigraphic Pollen Analysis of Sediments from Silver Lake, Fort Rock Basin. *Paleo Research Institute Technical Report* 01-30.

Scott-Cummings, Linda and Kathryn Puseman
1997 Pollen and Protein Residue Analysis of a Basalt Metate from the Locality III Site, 35LK3035, Oregon. Paleo Research Laboratories Technical Report 97-08. Golden, Colorado.

Sea, D. S. and Cathy Whitlock
1995 Postglacial Vegetation and Climate of the Cascade Range, Central Oregon. *Quaternary Research* 43:370-381.

Shackley, M. Steven
1990 *Early Hunter-Gatherer Procurement Ranges in the Southwest: Evidence from Obsidian Geochemistry and Lithic Technology*. Unpublished Ph.D. Dissertation, Arizona State University, Tempe, Arizona.
1996 Range and Mobility in the Early Hunter-Gatherer Southwest. In *Early Formative Adaptations in the Southern Southwest*, edited by Barbara J. Roth, pp. 5-16. Prehistory Press, Madison, Wisconsin.

Shipman, Pat, Giraud Foster, and Margaret Schoeninger
1984 Burnt Bones and Teeth: An Experimental Study of Color, Morphology, Crystal Structure, and Shrinkage. *Journal of Archaeological Science* 11:307-325.

Shott, M. J.
1993 *The Leavitt Site. A Parkhill Phase Paleo-Indian Occupation in central Michigan*. Memoirs of the Museum of Anthropology 25. University of Michigan, Ann Arbor.

Shutler, Richard Jr.
1956 A Pinon Nut Cache Near Tonopah, Nevada. *Plateau* 28(3):70-72.

Simms, Steven R.
1984 *Aboriginal Great Basin Foraging Strategies: An Evolutionary Analysis*. Ph.D. dissertation, University of Utah Press, Salt Lake City.

Simms, Cookie E., Gina Harris, and Malinda Wells
2000 The Bergen Main House Unit 3 Faunal Remains. Notes in possession of the authors.

Singer, Vivien J. and Guy L. Tasa
1999 Faunal Remains from the Paulina Lake Site. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in*

the Basin-Plateau Borderlands, by Thomas J. Connolly, pp. 211-212. University of Utah Anthropological Papers 121. Salt Lake City.

Skinner, Craig E.

1983 *Obsidian Studies in Oregon: An Introduction to Obsidian and An Investigation of Selected Methods of Obsidian Characterization Utilizing Obsidian Collected at Prehistoric Quarry Sites in Oregon*. Master's Terminal Project, Interdisciplinary Studies, University of Oregon, Eugene, Oregon.

1995a Radiocarbon Age Determinations. In *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project, Idaho, Washington, Oregon, and California, Volume V: Technical Studies*, edited by Robert U. Bryson, Craig E. Skinner, and Richard M. Pettigrew, pp. 6.1 - 6.36. Report prepared for Pacific Gas Transmission Company, Portland, Oregon, by INFOTEC Research Inc., Fresno, California, and Far Western Anthropological Research Group, Davis, California.

1995b Obsidian Characterization Studies. In *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project,Idaho, Washington, Oregon, and California, Volume V: Technical Studies*, by Robert U. Bryson, Craig E. Skinner, and Richard M. Pettigrew, pp. 4.1 - 4.54. Report prepared for Pacific Gas Transmission Company, Portland, Oregon, by INFOTEC Research Inc., Fresno, California, and Far Western Anthropological Research Group, Davis, California.

1995c Obsidian Hydration Studies. In *Archaeological Investigations, PGT-PG&E Pipeline Expansion Project,Idaho, Washington, Oregon, and California, Volume V: Technical Studies*, edited by Robert U. Bryson, Craig E. Skinner, and Richard M. Pettigrew, pp. 5.1 - 5.52. Report prepared for Pacific Gas Transmission Company, Portland, Oregon, by INFOTEC Research Inc., Fresno, California, and Far Western Anthropological Research Group, Davis, California.

1999 Oregon Obsidian Source Inventory and Geochemical Survey: A Progress Report. *Current Archaeological Happenings in Oregon* 24(3):5-7.

Skinner, Craig E., M. Kathleen Davis, and Thomas M. Origer

1995 X-Ray Fluorescence Analysis and Obsidian Hydration Rim Measurements of Artifact Obsidian from the Locality III (35-LK-3035), GP-2 (35-LK-2778), and Sage Sites, Lake County, Oregon. Biosystems Obsidian Studies Laboratory Report 95-53. Corvallis, Oregon.

Skinner, Craig E. and Jennifer J. Thatcher

2003 Results of XRF and Obsidian Hydration Studies: Paisley Fivemile Point Cavse (35-LK-3400), Lake County, Oregon. Northwest Research Obsidian Studies Laboratory, Corvallis, Oregon.

Skinner, Craig E. and Carol J. Winkler

1991 Prehistoric Trans-Cascade Procurement of Obsidian in Western Oregon: The Geochemical Evidence. *Current Archaeological Happenings in Oregon* 16(2):3-9.

1994 Prehistoric Trans-Cascade Procurement of Obsidian in Western Oregon: A Preliminary Look at the Geochemical Evidence. In *Contributions to the Archaeology of Oregon: 1989-1994*, edited by Paul Baxter, pp. 29-44. Association of Oregon Archaeologists Occasional Papers 5. Eugene, Oregon.

Smiley, T. L.

1976 Memorial to Ernst Valdemar Antevs 1888-1974. *Geological Society of America,* pp. 1-7.

Smith, G. I., and F. A. Street-Perrott

1983 Pluvial Lakes of the Western United States. In *Late Quaternary Environments of the United States, Vol.* 1, edited by S. C. Porter, pp. 190-211. University of Minnesota Press, Minneapolis.

Snyder, Sandra L.

1981a Medicine Creek. Report to the Umpqua National Forest by the Department of Anthropology, Oregon State University, Corvallis.

1981b Medicine Creek: Pre- and Post-Mazama Occupation in the Cascades. *Tebiwa* 23:1-13.

Spaulding, W. Geoffrey

1990 Vegetation Dynamics during the Last Deglaciation, Southeastern Great Basin, USA. *Quaternary Research* 33:188-203.

1991 Pluvial Climatic Episodes in North America and North Africa: Types and Correlation with Global Climate. *Palaeogeography, Palaeoclimatology, Palaeoecology* 84:217-227.

Spaulding, W. Geoffrey , and L. J. Graumlich

1986 The Last Pluvial Climatic Episodes in the Deserts of Southwestern North America. *Nature* 320:441-444.

Spaulding, W. Geoffrey, E. B. Leopold, and T. R. Van Devender

1983 Late Wisconsin Paleoecology of the American Southwest. In *Late Quaternary Environments of the United States, Vol. 1, The Late Pleistocene 1*, edited by S.C. Porter, pp. 259-293. University of Minnesota Press, Minneapolis.

Spier, Leslie

1930 Klamath Ethnography. *University of California Publications in American Archaeology and Ethnology* 30. Berkeley.

Sprague, Roderick

1992 Letter Report 92-6: Fort Rock Beads. Alfred W. Bowers Laboratory of Anthropology, University of Idaho, Moscow.

Stenholm, Nancy

1994 Paleoethnobotanical Analysis of Samples Recovered in the Fort Rock Basin. In *Archaeological Researches in the Northern Great Basin: Fort Rock Archaeology Since Cressman,* edited by C. Melvin Aikens and Dennis L. Jenkins, pp 531-560. University of Oregon Anthropological Papers 50, Eugene.

1999 Macrobotanical Analysis. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*, by Thomas J. Connolly, pp. 189-201. University of Utah Anthropological Papers 121. Salt Lake City.

Stern, Theodore
1965 The Klamath Tribe: A People and their Reservation. *American Ethnological Society, Monograph* 41. University of Washington, Seattle.
Steward, Julian H.
1933 Ethnography of the Owens Valley Paiute. *University of California Publications in American Archaeology and Ethnology* 33(3):233-350. Berkeley.
1938 *Basin-Plateau Aboriginal SocioPolitical Groups*. Smithsonian Institution Bureau of American Ethnology, Bulletin 120.
1941 *Archeological Reconnaissance of Southern Utah*. Anthropological Papers 18, Bureau of American Ethnology Bulletin, 128. Washington D. C.
Storck, P. L.
1997 *The Fisher Site. Archaeological, Geological and Paleobotanical Studies at an Early Paleo-Indian Site in Southern Ontario, Canada*. Memoirs of the Museum of Anthropology no. 30. University of Michigan, Ann Arbor.
Struever, Stuart and G. L. Houart
1972 An Analysis of the Hopewell Interaction Sphere. In *Social Exchange and Interaction*, edited by E. N. Wilmsen, pp. 47-79. University of Michigan Museum of Anthropology Anthropological Papers No. 46.
Stuiver, Minze and Paula J. Reimer
1993 Extended 14C Data Base and Revised Calib 3.0 14C Age Calibration Program. *Radiocarbon* 35(1):215-230.
2000 Radiocarbon Calibration Program Rev. 4.3. University of Washington Quaternary Isotope Lab, Seattle.
Stuiver, Minze, P. J. Reimer, and T. F. Braziunas
1998 High-precision radiocarbon age calibration for terrestrial and marine samples. *Radiocarbon* 40:1127-1151.
Sundall, Elaine and Winfield Henn
1993 Borax Lake Pattern Assemblages on the Shasta-Trinity National Forests, North-Central California. *Journal of California and Great Basin Anthropology* 15:1:73-89.
Tadlock, W. L.
1966 Certain Crescentic Stone Objects as a Time Marker in the Western United States. *American Antiquity* 31(5): 662-675.
Tang, M., and E. R. Reiter
1984 Plateau Monsoons of the Northern Hemisphere: A Comparison between North America and Tibet. *Monthly Weather Review* 112:617-637.
Tankersley, K. B.
1994 The Effects of Stone and Technology on Fluted Point Morphometry. *American Antiquity* 59:498-510.
Taylor, A.
2002 Results of a Great Basin Fluted Point Survey: Chronological and Functional Relationships between Fluted and Stemmed Points. Senior Honors Thesis, Hamilton College, Clinton, NY.
Taylor, R. E., C. Vance Haynes, Jr., and M. Stuiver
1996 Clovis and Folsom Age Estimates: Stratigraphic Context and Radiocarbon Calibration. *Antiquity* 70:515-525.
Testart, Alan
1982 The Significance of Food Storage among Hunter-Gatherers: Residence Patterns, Population Densities, and Social Inequalities. *Current Anthropology* 23(5):523-537.
Thatcher, Jennifer J.
1999 Distribution of Geochemically Characterized Non-Cultural Obsidian from the Silver Lake/Sycan Marsh Obsidian Source, South-Central Oregon. *Current Archaeological Happenings in Oregon* 24(3):8–11.
2001 The Distribution of Geologic and Artifact Obsidian from the Silver Lake/Sycan Marsh Geochemical Source Group, South-Central Oregon. Unpublished Master's Thesis, Interdisciplinary Studies, Oregon State University, Corvallis, Oregon.
Thomas, David Hurst
1969 Great Basin Hunting Patterns: A Quantitative Method for Treating Faunal Remains. *American Antiquity* 34(4): 392-401.
1979 *Archaeology*. Holt, Rinhart and Winston, New York.
1983 The Archaology of Monitor Valley: Vol. 1 Epistemology. *Anthropological Papers of the American Museum of Natural History* 58(1):1-194. New York.
1985 The Archaeology of Hidden Cave, Nevada. *Anthropological Papers of the American Museum of Natural History* 61. New York.
Thompson, R. S.
1988 Western North America—Vegetation Dynamics in the Western United States: Modes of Response to Climatic Fluctuations. In *Vegetation History. Handbook of Vegetation Science, Vol.* 7, edited by B. Huntley and T. Webb III, pp. 415-458. Kluwer Academic Publishers, Dordrecht.
1990 Late Quaterary Vegetation and Climate in the Great Basin. In *Packrat Middens: The Last 40,000 Years of Biotic Change*, edited by J. L. Betancourt, T. R. Van Devender, and P. S. Martin, pp. 200-239. University of Arizona Press, Tucson.
1992 Late Quaternary Environments in Ruby Valley, Nevada. *Quaternary Research* 37:1-15.
Thompson, R. S., and J. I. Mead
1982 Late Quaternary Environments and Biogeography in the Great Basin. *Quaternary Research* 17:39-55.
Thompson, R. S., C. Whitlock, P. J. Bartlein, S. P. Harrison, and W. G. Spaulding
1993 Climatic Changes in the Western United States since 18,000 Yr. B.P. In *Global Climates since the Last Glacial Maximum*, edited by H. E. Wright, Jr., J. E. Kutzbach, T. Webb III, W. F. Ruddiman, F. A. Street-Perrott, and P. J. Bartlein, pp. 468-513. University of Minnesota Press, Minneapolis.
Titiev, Mischa
1937 A Hopi Salt Expedition. *American Anthropologist* 39:244-258.

Toepel, Kathryn A. and Stephen D. Beckham
1981 Survey and Testing of Cultural Resources Along the Proposed Bonneville Power Administration's Buckley-Summer Lake Transmission Line Corridor, Central Oregon. *Bonneville Cultural Resources Group (Eastern Washington University) Report* 100-5.
Toepel, Kathryn A. and Ruth L. Greenspan
1985 Fish Remains from an Open Site in the Fort Rock Basin. *Journal of California and Great Basin Anthropology* 7(1):109-116.
Toepel, Kathryn A., Rick Minor, and William F. Willingham
1980 *Human Adaptation in the Fort Rock Basin: A Class II Cultural Resources Inventory of BLM Lands in Christmas Lake Valley, South-Central Oregon.* Report of the Department of Anthropology, University of Oregon, to the Lakeview District, Bureau of Land Management.
Toll, Mollie S.
1988 Flotation Sampling: Problems and Some Solutions, with Examples from the American Southwest. In *Current Paleoethnobotany: Analytical Methods and Cultural Interpretations of Archaeological Plant Remains*, edited by C. Hastorf and V. S. Popper, pp. 36-52. University of Chicago Press.
Train, P., J. R. Heinrichs, and W. A. Archer
1941 Medicinal Uses of Plants by Indian Tribes of Nevada. *Contributions Toward a Flora of Nevada* 33. Bureau of Plant Industry, U.S. Department of Agriculture, Washington D.C.
Tuohy, Donald R.
1969 A Brief Note on Additional Fluted Points from Nevada. *Nevada State Museum Anthropological Papers* 14:170-177. Carson City.
Turner, R. M.
1994 Great Basin Desertscrub. In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by D. E. Brown, pp. 145-155. University of Utah Press, Salt Lake City.
Van Devender, T. R., R. S. Thompson, and J. L. Betancourt
1987 Vegetation History of the Deserts of Southwestern North America: the Nature and Timing of the Late Wisconsin-Holocene Transition. In *North America and Adjacent Oceans During the Last Deglaciation, The Geology of North America, Vol. K-3*, edited by W. F. Ruddiman and H. E. Wright, Jr., pp. 323-352. Geological Society of America, Boulder, Colorado.
Van Dyke, W. A., A. Sands, J. Yoakum, A. Polenz, and J. Blaisdell
1986 Bighorn Sheep. In *Wildlife Habitats in Managed Rangelands-The Great Basin of Southeastern Oregon*, eds. J. W. Thomas and C. Maser, USDA Forest Service and U. S. Department of the Interior, Bureau of Land Management.
Vellanoweth, René. L.
1995 New Evidence from San Nicolas Island Concerning the Distributions and Manufacture of *Olivella* Grooved Rectangle Beads. *Pacific Coast Archaeological Society Quarterly* 31(4): 13-22.
2001 AMS Radiocarbon Dating and Shell Bead Chronologies: Middle Holocene Trade and Interaction in Western North America. *Journal of Archaeological Science* 28:941-950.
Villa, P. and J. Courtin
1983 The Interpretation of Stratified Sites: A View from Underground. *Journal of Archaeological Science* 10:267-281.
Voegelin, Erminie W.
1942 Culture Element Distributions: XX Northeast California. *University of California Anthropological Records* 7(2).
Von Post, L.
1946 The Prospect for Pollen Analysis in the Study of the Earth's Climatic History. *New Phytologist* 45:193-217.
Walker, G. W. and N. S. MacLeod
1991 *Geologic Map of Oregon*. U.S. Geological Survey.
Walsh, Michael R.
1998 Lines in the Sand: Competition and Stone Selection on the Pajarito Plateau, New Mexico. *American Antiquity* 63:573-593.
Warren, Claude N., and C. Phagan
1988 Fluted Points in the Mojave Desert: Their Technology and Cultural Context. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 121-130. Nevada State Museum Anthropological Papers 21. Carson City.
Wells, P. V.
1983 Paleobiogeography of Montane Islands in the Great Basin since the Last Glaciopluvial. *Ecological Monographs* 53:341-382.
Wheat, Margaret M.
1967 *Survival Arts of the Primitive Paiutes*. University of Nevada Press. Reno.
Whiting, Beatrice B.
1950 *Paiute Sorcery*. Viking Fund Publications in Anthropology 15. New York.
Whitlock, Catherine and Patrick J. Bartlein
1993 Spatial Variations of Holocene Climatic Change in the Yellowstone Region. *Quaternary Research* 39:231-238.
Wigand, Peter E.
1987 Diamond Pond, Harney County, Oregon: Vegetation History and Water Table in the Eastern Oregon Desert. *Great Basin Naturalist* 47:427-458.
Wigand, Peter E. and David Rhode
2002 Great Basin Vegetation History and Aquatic Systems: The Last 150,000 Years. In *Great Basin Aquatic Systems History*, edited by R. Hershler, D. B. Madsen, and D. R. Currey, pp. 309-367. Smithsonian Contributions to Earth Sciences 33. Smithsonian Institution Press, Washington D.C.
Wilkins, D. E., and D. R. Currey
1999 Radiocarbon Chronology and a ^{13}C Analysis of Mid- to Late-Holocene Aeolian Environments, Guadalupe Mountains National Park, Texas, USA. *The Holocene* 9:363-371.
Williams, Shirley B. and John L. Fagan

1999 Blood Residue Analysis. In *Newberry Crater: A Ten-Thousand-Year Record of Human Occupation and Environmental Change in the Basin-Plateau Borderlands*, by Thomas J. Connolly, pp. 213-217. University of Utah Anthropological Papers 121. Salt Lake City.

Willig, Judith A.

1986 Lakeside Settlement Pattern in the Dietz Sub-basin: A Summary of the 1984-1986 Research. Paper presented at the 20th Biennial Great Basin Anthropological Conference, Las Vegas, Nevada.

1988 Paleo-Archaic Adaptations and Lakeside Settlement Patterns in the Northern Alkali Basin. In *Early Human Occupation in Far Western North America: the Clovis—Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens and John L. Fagan, pp. 417-482. Nevada State Museum Anthropological Papers 21. Carson City.

1989 *Paleo-Archaic Broad Spectrum Adaptations at the Pleistocene-Holocene Boundary in Far Western North America.* Ph.D. dissertation, Department of Anthropology, University of Oregon.

1991 Clovis Technology and Adaptation in Far Western North America: Regional Pattern and Environmental Context. In *Clovis Origins and Adaptations,* edited by R. Bonnichsen and K. L. Turnmire, pp. 91-118. Center for the Study of the First Americans, Oregon State University, Corvallis.

Willig, Judith A. and C. Melvin Aikens

1988 *The Clovis-Archaic Interface in Far Western North America.* In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 1-40. Nevada State Museum Anthropological Papers 21. Carson City.

Judith A. Willig, C. Melvin Aikens and John L. Fagan

1988 *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*. Nevada State Museum Anthropological Papers 21. Carson City.

Wingard, George F.

1999 *Carlon Village: Land, Water, Subsistence, and Sedentism in the Northern Great Basin*. Ph.D. Dissertation, Department of Anthropology, University of Oregon, Eugene, Oregon.

2001 *Carlon Village: Land, Water, Subsistence, and Sedentism in the Northern Great Basin*. University of Oregon Anthropological Papers 57. Eugene.

Winthrop, Kathryn

1993 Prehistoric Settlement Patterns in Southwest Oregon. PhD dissertation, Department of Anthropology, University of Oregon, Eugene.

Womack, Bruce R.

1977 An Archaeological Investigation and Technological Analysis of the Stockhoff Basalt Quarr, Northeastern Oregon. MA thesis, Department of Anthropology, Washington State University. Pullman.

Wright, Jessie L.

1982 *How High the Bounty*. Friends of the Douglas County Museum, Roseburg, Oregon.

Yohe, R. M., M. E. Newman, and J. S. Schneider

1991 Immunological Identification of Small-Mammal Proteins on Aboriginal Milling Equipment. *American Antiquity* 56(4):659-666.

Zalunardo, R. A.

1965 The Seasonal Distribution of a Migratory Mule Deer Herd. *Journal of Wildlife Management* 29: 345-351.

Zenk, Henry B. and Bruce Rigsby

1998 Molala. In *Handbook of North American Indians,* Vol. 12, *Plateau*, edited by Deward E. Walker, Jr., pp 439-445. Smithsonian Institution, Washington, D.C.

Zielinski , G. A., and W. D. McCoy

1987 Paleoclimatic Implications of the Relationship between Modern Snowpack and Late Pleistocene Equilibrium-line Altitudes in the Mountains of the Great Basin, Western U.S.A. *Arctic and Alpine Research* 19:127-134.