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NEWS AND INFORMATION

NEWS AND NOTES

Have news or announcements to share? Send them to IAOS.Editor@gmail.com for inclusion in the next issue of the *IAOS Bulletin*.

CONSIDER PUBLISHING IN THE IAOS *BULLETIN*

The *Bulletin* is a twice-yearly publication that reaches a wide audience in the obsidian community. Please review your research notes and consider submitting an article, research update, news, or lab report for publication in the *IAOS Bulletin*. Articles and inquiries can be sent to IAOS.Editor@gmail.com Thank you for your help and support!

CHERYL MACK WINS SKINNER POSTER AWARD AT 2023 SAA

The Craig E. Skinner Poster Award highlights the best obsidian-focused poster presented at a major archaeological conference, as selected by the IAOS Awards Committee, comprised of members of the IAOS Executive Board. Winning posters present unique research, innovative application of methods, and creative analysis of obsidian materials. The winning poster's abstract can be found on page 4 of this issue of the *IAOS Bulletin*.

Welcome to Dr. Theodora Moutsiou, IAOS President

Dr. Theodora Moutsiou (https://ucy.academia.edu/TheodoraMoutsiou) is a postdoctoral researcher at the Archaeological Research Unit at the Department of History and Archaeology if the University of Cyprus, as well as Adjunct Senior Research Fellow at James Cook University of Australia and the Max Planck Institute for the Science of Human History. Dr. Moutsiou holds a Ph.D. in Palaeolithic Archaeology from Royal Holloway, University of London, an M.A. (Distinction) in the Archaeology of Human Origins from the University of Southampton and a B.A. (Distinction) in History and Archaeology from Aristotle University of Thessaloniki. Dr. Moutsiou is currently the coordinator of project MIGRATE (https://www.ucy.ac.cy/migrate/). Prior to these appointments, she was involved as postdoctoral researcher in a number of multidisciplinary research projects, including projects PLACe, SaRoCy and PLEICY from the Research and Innovation Foundation of Cyprus and the highly prestigious E.U. funded Marie Skłodowska-Curie Individual Fellowship, for which she secured funding. In 2018, she was awarded Young Scientist of the Year by the Research and Innovation Foundation, Cyprus, for her scientific contributions to the field of Archaeology.

Her field of expertise is the study of prehistoric movement, mobility, and exchange through the analysis of raw material circulation and selection. She combines traditional archaeological methods (excavation, survey, lithic analysis) with cutting-edge approaches (geochemistry, geospatial analysis, paleoecology) to address major research questions in human cognitive and behavioral evolution. Geochemical and geospatial data is combined with exchange and evolutionary ecology theory to understand prehistoric social interaction and cognitive evolution. Ecological data is used to reconstruct the environmental and climatic context of past human activity. Starting with her post-doctoral research, she has also been focusing on island archaeology, investigating island colonization, human-environment interaction, and impacts of climate change on Pleistocene hunter-gatherer communities. Her scientific approach combines regional engagement with global comparative perspectives providing significant new knowledge for the study of prehistoric phenomena of global importance. Dr. Moutsiou applies innovative interdisciplinary methodologies that bridge the gap between STEM and HSS to test novel concepts and engage with questions in the broader field of social archaeology and human evolutionary studies as well as archaeological and environmental science.

Dr. Moutsiou has been a collaborator in numerous national and international archaeological field projects covering a span of periods, with a focus on the Paleolithic, and regions (Mediterranean, Europe, Africa, Australia) in the last twenty years, such as Stelida Naxos Archaeological Project (SNAP). Since 2018, she directs her own field research projects on Cyprus aimed at establishing new research themes on the island via the identification of Pleistocene localities.

She has a track record of 15 first authored and co-authored international journal articles and book chapters, including a monograph; two articles are currently in press. These include articles in high-ranking international journals such as *Quaternary International, Journal of Archaeological Science: Reports*, and *Journal of Mediterranean Archaeology*. She has participated in over 20 conferences and workshops around the world where she was invited to present her work and organize dedicated sessions. Dr. Moutsiou is also a reviewer for peer-reviewed international journals and an evaluator for E.U. programmes where she also consults on cultural heritage policies. She is a full member of international associations, such as International Association for Obsidian Studies (IAOS), Quaternary Research Association (QRA), Centre for the Archaeology of Human Origins (CAHO), The Canadian Institute in Greece (CIG), European Association of Archaeologists (EAA), and serves as board member in committees, such as Cultural Heritage and New Technologies (CHNT) and Computer Applications and Quantitative Methods in Archaeology (CAA-GR). She also takes steps in connecting with the broader community and inspiring children and young adults to engage with archaeology and science.

NOTES FROM THE PRESIDENT

Hello IAOS members, my name is Theodora Moutsiou, and I am the new President of the IAOS. I take over from Sean Dolan, whom I would like to thank for his service over the past few years. I would also like to thank the IAOS Board for their assistance in facilitating the transition to my new role. As a researcher working on the other side of the pond, I have plenty to learn about the Association's activities on American soil; I do, nevertheless, consider this post an amazing opportunity to increase IAOS' reach beyond the American continent, utilizing my expert networks and local knowledge, especially within Europe. Being Greek, I have been familiar with the obsidian sources of Melos and Yiali since my childhood. I have studied all the Aegean obsidian sources as part of my Ph.D. thesis alongside east Africa and central Europe over ten years ago, more recently concentrating on the Mediterranean and Near East in the context of several research projects. From my position as a postdoctoral researcher/special scientist at the Archaeological Research Unit, University of Cyprus, I have focused on the maritime transportation of obsidian in the eastern Mediterranean and generated important new knowledge on the consumption of obsidian as an exotic material on the island of Cyprus. New obsidian finds located by my team during recent fieldwork are expected to rewrite the island's prehistory and challenge traditional narratives about our ancestors' skills. More on that in forthcoming publications, but I could not resist a photograph of a beautiful obsidian bladelet collected during last year's field surveys on Cyprus (photo1).

Photo 1. Obsidian bladelet collected during field surveys on Cyprus.

Plans are in motion to return to the field and carry on with our obsidian analyses (photo 2), but before that the 2023 International Obsidian Conference (IOC) is fast approaching. This year the IOC is taking place in Engaru, Japan, between the 2nd-6th of July. As always, it promises to be an exciting event and a great chance to meet up with colleagues again in person after the long pandemic measures. Personally, I am very excited to be returning to the place where, back in 2014, I spent two amazing weeks studying, discussing and knapping obsidian with a group of young obsidian scholars! I am confident I will have plenty to share from the IOC in my next column.

I look forward to seeing at least some of you in July, and, please feel free to contact me with any questions or suggestions at any time.

Many thanks,
Dora

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Photo 2. Theodora (Dora) Moutsiou and Andreas Charalambous conducting pXRF analyses on obsidian artefacts in the premises of the Archaeological Research Unit, University of Cyprus in the summer of 2022. Masks still on!

CHERYL MACK WINS SKINNER POSTER AWARD AT 2023 SAA

Please join us in congratulating Cheryl Mack (Olallie Research), winner of the 2023 Craig E. Skinner Poster Award at the SAA for the poster entitled "Evidence for Winter Bear Hunting from Lava Tube Caves in Southwest Washington." The SAA abstract provides this overview of the poster: "The southwestern flanks of Mt. Adams, Washington, contain numerous lava tube caves. These lava tubes can be quite complex, containing narrow passages on multiple levels. In the course of exploring these lava tubes, modern cavers have inadvertently discovered a total of 16 projectile points and a flake tool, within 12 different lava tubes. These artifacts were all found within the "dark zone" and taken together these discoveries reflect a pattern of precontact cave use. A variety of analyses have been performed in an attempt to determine the function and age of these artifacts, including technological/use-wear analysis, blood protein residue analysis, obsidian sourcing and obsidian hydration. Positive blood protein residue results, coupled with ethnographic accounts of winter bear hunting, suggest that these artifacts may be related to the hunting of hibernating bears in their dens in winter."

Skinner Poster Award winners receive a $200 cash prize and a one-year membership to the IAOS. We invite award recipients to publish their work in the *IAOS Bulletin,* so please watch for more information about this fascinating project. Congratulations!

STRUCTURAL WATER CONTENT AND HYDRATION RATE OF CASA DIABLO OBSIDIAN, EASTERN CALIFORNIA

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Abstract

Casa Diablo is an archaeologically significant obsidian source in Mono County, eastern California. Two sub-sources have been identified geochemically: Sawmill Ridge and Lookout Mountain. An equation has been published relating hydration rate of obsidian to structural (intrinsic) water content and temperature (Rogers and Stevenson 2023). We have measured the structural water content of ten specimens, five from each sub-source, by FTIR spectroscopy and computed hydration rates: 13.90 ± 0.96 μ^2/1000 yrs. at 20°C for Lookout Mountain (N = 5) and 13.30 ± 0.85 μ^2/1000 yrs. for Sawmill Ridge (N = 5). These two rates are not statistically distinguishable at the 95% confidence level and may be combined into a composite rate of 13.60 ± 0.91 μ^2/1000 yrs. (N = 10). It thus appears that distinguishing the sub-sources is not necessary for chronometrics, although it may be useful for studies of obsidian trade and exchange.

Introduction

Pre-colonially, the Casa Diablo obsidian source was one of the most significant toolstone quarries in California. Because of this prominence, Casa Diablo obsidian has garnered significant archaeological attention. In addition to decades-long efforts to map and characterize the deposit (Faust 1994), many source specific obsidian hydration rates have been proposed (Hall and Jackson 1989; Rogers 2017). Unfortunately, several methodological issues have hampered the veracity of some proposed rates. Among the most potentially significant of these is a failure to account for intrinsic water within the source material (Stevenson et al. 2019). Recently a new equation has been published relating obsidian hydration rate to structural (intrinsic) water content and temperature (Rogers and Stevenson 2023). This paper supports the validity of that rate and offers evidence for using a single hydration rate for Casa Diablo obsidian regardless of its geochemical categorization.

Quarry Setting

The Long Valley Caldera is located immediately northeast of the town of Mammoth Lakes in central California. The caldera formed 760,000 years ago when the magma chamber underlying it catastrophically erupted ejecting ash and debris as far as Nebraska (Bailey et al. 1976; Hill 2006: 274). The caldera is one of the world's largest, measuring 32 kilometers (20 miles) by 17.6 kilometers (11 miles) (Brady 2015: 23). The caldera floor supports a complex geologic landscape largely shaped by subsequent volcanism (Hall 1983). The western caldera contains the Casa Diablo obsidian source, an extensive complex of archaeologically significant obsidian exposures. This indigenous toolstone source consists of many discrete outcrops comprising more than 2,000 acres of geological exposure within approximately 80,000 acres of caldera. These exposures present in three depositional environments, most commonly eroding from the margins of resurgent rhyolitic domes, as secondary deposits of water worn cobbles within Pleistocene lake sediments, and as airflow beds of smaller clast sized materials. The latter is generally too diminutive in size to function as a source for flaked stone tools (Woolfenden 1994: 41-43).

Archaeological Context

Despite the completion of an extensive archaeological survey within the Long Valley caldera in the 1950s (Meighan 1955), it was not until Emma Lou Davis (1961) recorded CA-MNO-1 that the Casa Diablo obsidian quarry was first archaeologically recognized (Faust 1994a: 6). A decade later, Lewis Tadlock deviated from an excavation at nearby CA-MNO-611 and inadvertently located the lower Dry Creek quarry (Tadlock and Tadlock 1972: 18-19). Subsequent compliance work conducted during the mid-1970s identified additional significant obsidian exposures including Lookout Mountain (Bettinger 1976) and Sawmill Ridge (Bettinger 1978). Further archaeological discoveries occurred during the Inyo National Forest quarry mapping efforts of the late 1980s and early 1990s (Faust 1994b: appendix A). Archaeologically exploited obsidian occurs at eight main locations within the Casa Diablo obsidian complex. The named and spatially distinct exposures include Lookout Mountain, Dry Creek Canyon, Antelope Quarries, Central Dome, Obsidian Hill, Hot Creek Terrace, Sawmill Ridge, and Little Hot Creek (Faust 1994b: appendix A).

Within the eastern Sierra region, Casa Diablo obsidian is present in many archaeological contexts and settings. These include sites in the Sierra Nevada (Burge 2010; Stevens 2005), throughout the northern Owens Valley (Basgall and Delacorte 2012), in the Benton and White-Inyo Ranges, and on the intervening Volcanic Tableland (Bettinger 1976, 1991; Giambastiani 2004). Further removed to the west, obsidian from the Casa Diablo source dominates lithic assemblages in the central San Joaquin Valley from the Merced River south to the Tulare Lake area (Bouey and Basgall 1984: 138; Jackson and Ericson 1994: 397; Sutton and Des Lauriers 2002). Casa Diablo obsidian is also present in significant amounts in many sites on the central coast (Fredrickson et al 2006: 152, Figure 1). The widespread distribution of Casa Diablo obsidian demonstrates its importance as a source of precolonial toolstone material.

Prior Obsidian Studies

Obsidian archaeometrics have long been utilized to study artifacts associated with the Casa Diablo obsidian quarry. Site CA-MNO-382, located on the southwestern edge of the quarry, is notable as the location of an early archaeological application of obsidian hydration analysis (Michels 1964, 1965). That study attempted to use hydration rim measurements from excavated obsidian debitage to gauge stratigraphic integrity.

Since that time, several source specific hydration rates have been proposed for obsidian originating from the Casa Diablo locality (Basgall 1983: 130-134; Ericson 1975; Hall 1983, 1984; Jackson 1984; Michels 1982; Rogers 2017; Rogers and Stevenson 2023). The obsidian hydration rate formulations applied to Casa Diablo obsidian include artifact baselining (i.e. comparing artifacts from the same archaeological context but from different obsidian sources) (Rogers 2017), empirical methods using hydration band measurements paired with diagnostic projectile points (Bouey and Basgall 1984; Hall 1984; Jackson 1984; Hall and Jackson 1989; Michels 1965; Stevens 2005) induced hydration (Michels 1982), and paired radiocarbon and hydration measurement associations (Ericson 1975, 1977). These rates and the methods used to arrive at them, vary in approach and validity (Fredrickson 2006; Hall and Jackson 1989; Hildebrandt 1997: 289; Hull 2001; Meighan 1983; Rogers 2017).

While the sheer number of these studies precludes a comprehensive review of each method here, Hall and Jackson (1989: 33-53) provide an overview and critique of early attempts to establish a hydration rate for Casa Diablo. While Rogers and Stevenson (2020) provide a recent and comprehensive review of obsidian hydration rate formulation methods and their validity.

In addition to attempts at establishing a hydration rate for Casa Diablo obsidians, there have also been several attempts to geochemically characterize the material emanating from the Casa Diablo quarry. The most comprehensive of these was conducted by Hughes (1994). In that study, 200 obsidian samples from 20 exposures across the deposit were analyzed using short-wave x-ray florescence. Hughes was able to chemically differentiate two unique geochemical compositions among the samples: Lookout Mountain and Sawmill Ridge. Hughes also suggested that a third geochemical variant, Prospect Ridge, may be distinguishable with additional study.

Currently, the spatial distribution and abundance of obsidian geochemically categorized as belonging to the Prospect Ridge locality is unknown. Analytical convention has typically differentiated Sawmill Ridge and Lookout Mountain obsidians based on their trace geochemical ratios. However, the archaeological need for such parsing is currently unknown since the two geochemical sub-sources have not been demonstrated to hydrate at different rates. Additionally, since the spatial distribution of these two geochemical groups is un-mapped and their relation to archaeologically identified outcrops is largely unknown, segregating obsidian samples into these categories currently offers little explanatory value regarding patterns of precolonial obsidian procurement.

Sample Artifacts

Ten obsidian artifacts were selected for intrinsic water content measurement. These were recovered from archaeological contexts within the eastern Sierra Nevada region (Haverstock 2008). Artifacts from MNO-169, MNO-1120, MNO-4289, and CA-MNO-4620 are included in the sample. These specimens had previously been subjected to x-ray florescence and obsidian hydration rim measurements performed at the Northwest Research Obsidian Studies Laboratory (Skinner 2007, 2009). The selected sub-sample was previously determined to contain five specimens derived from the Lookout Mountain sub-source and five specimens originating from the Sawmill Ridge sub-source. (Table 1).

Specimen	Site	Unit	Depth	Type	Source (XRF)
30	CA-MNO-4620	10	20-30	Debitage	Lookout Mtn.
36	CA-MNO-4620	10	0-10	Debitage	Lookout Mtn.
23	CA-MNO-1120	NA	Surface	Debitage	Lookout Mtn.
9	CA-MNO-1120	NA	Surface	Debitage	Lookout Mtn.
16	CA-MNO-1120	NA	Surface	Debitage	Lookout Mtn.
17	CA-MNO-1120	NA	Surface	Debitage	Sawmill Ridge
18	CA-MNO-1120	NA	Surface	Debitage	Sawmill Ridge
20	CA-MNO-1120	NA	Surface	Debitage	Sawmill Ridge
29	CA-MNO-4289	NA	Surface	Debitage	Sawmill Ridge
8	CA-MNO-169	NA	Surface	Biface Fragment	Sawmill Ridge

Table 1. Casa Diablo obsidian specimens.

Specimen	Weight in air, gm	Weight in liquid, gm	Temp (°C)	Density of liquid, gm/cm³	Artifact density, gm/cm³
30	1.388	0.4643	23.5	1.5906	2.3901
36	0.8582	0.2856	22.9	1.5916	2.3854
23	1.8608	0.6213	23.0	1.5914	2.3891
9	1.7339	0.5801	23.0	1.5914	2.3915
16	2.5802	0.8635	23.3	1.5909	2.3911
17	0.6957	0.2322	23.5	1.5906	2.3874
18	2.0478	0.6853	23.5	1.5906	2.3906
20	1.0233	0.3428	23.4	1.5907	2.3920
29	0.1935	0.0643	23.2	1.5911	2.3829
8	1.2627	0.4208	23.3	1.5909	2.3861

Table 2. Density of Casa Diablo obsidian specimens.

Laboratory Procedure and Results

We determined structural water content by Fourier Transform Infrared (FTIR) spectroscopy. Specimens were cut with a slow speed Buehler saw, rough polished on a lapidary wheel, and polished to a mirror finish with a 400 grit abrasive pad mounted on a vertical lapidary wheel. The specimens were parallel-sided, and thickness was measured with a Mitutoyo micrometer with a precision of 0.001 mm. Specimen density was measured by gravimetry where the weight of the specimen was measured in air and immersed in Unigrav 1.6 fluid, and specimen density d_s computed from the equation:

$$d_s = d_f*w_a/(w_a - w_f) \qquad (1)$$

where w_a is the weight of the specimen in air, w_f is weight of the specimen when immersed in fluid, and d_f is the density of the fluid. The density of the fluid was calibrated for temperature by the method described in Stevenson et al. 2019. Table 2 shows the resulting density.

Infrared absorbance was measured at the 4500cm^{-1} and 5200cm^{-1} bands to determine weight percent of hydroxyl (OH) and molecular water (H_2O_m). The FTIR instrument was a Thermo Nicolet Is10. Each measurement was an average of 128 scans collected at a mirror velocity of 0.2cm/sec and a resolution of 32cm^{-1}. Concentrations of water species were then calculated using the Beer-Lambert law:

$$w = 100*M*A/(d*t*\varepsilon) \qquad (2)$$

where w is wt.% concentration of either OH or H_2O_m, M is molecular weight (18.02), A is infrared absorbance, d is density in gm/L, t is thickness in cm, and ε is the molar absorption coefficient in L/(mol*cm). The values of ε employed here are 1.73 ± 0.02 for OH and 1.61 ± 0.05 for H_2O_m (Newman et al. 1986: 1537, Table 7). The resulting values of water concentration are in Table 3.

The H_2O_t statistics for the two sub-sources are: Lookout Mountain, H_2O_t = 0.3888 ± 0.0555 wt.% (N = 5); Sawmill Ridge H_2O_t = 0.3524 ± 0.0529 wt.% (N = 5). A t-test yields t = 0.39, so the difference in water content for the two sub-sources is not statistically distinguishable at the 95% confidence level (threshold = 1.96). A composite value for water content is H_2O_t = 0.3706 ± 0.0546 (N = 10), with a coefficient of variation (CV) = 0.1474.

Hydration Rates

The hydration rate at a given temperature is determined by the intrinsic water content of the obsidian and the temperature. Geochemical studies have led to equations for the hydration rate of obsidian in terms of

Spec.	Source (XRF)	Thickness (cm)	Density (g/L)	ABS $4500cm^{-1}$	OH, wt.%	ABS $5200cm^{-1}$	H_2Om, wt.%	$\%H_2O_t$, wt.%
30	LM	0.0322	2390	0.0161	0.2179	0.0129	0.1876	0.4055
36	LM	0.0407	2385	0.0148	0.1588	0.0165	0.1902	0.3490
23	LM	0.0389	2389	0.0188	0.2107	0.0114	0.1373	0.3480
9	LM	0.0362	2391	0.0139	0.1672	0.0151	0.1952	0.3625
16	LM	0.0272	2391	0.0169	0.2707	0.0121	0.2082	0.4789
17	SR	0.0351	2387	0.0171	0.2126	0.011	0.1469	0.3595
18	SR	0.0326	2391	0.0148	0.1978	0.011	0.1580	0.3558
20	SR	0.0332	2392	0.0151	0.1981	0.0106	0.1494	0.3474
29	SR	0.0259	2383	0.0146	0.2464	0.0098	0.1777	0.4241
8	SR	0.0435	2386	0.0171	0.1716	0.0096	0.1035	0.2751

Table 3. Intrinsic water concentration for Casa Diablo obsidian.

temperature, pressure, and intrinsic water content (Zhang et al. 1991; Zhang and Behrens 2000). However, the data were based on temperatures (400 – 1200ºC) and pressures (0.1 – 810 mPa) of interest to volcanology, and the equations do not extrapolate correctly to ambient archaeological temperatures. Rogers and Stevenson (2021; 2023) developed an equation relating intrinsic water content and temperature to hydration rate for obsidian in the temperature and pressure ranges typical of archaeology, so that, if intrinsic water content of the specimen is measured, the hydration rate can be computed for any desired EHT. The equation is based on a least-squares best fit of a mathematical model to a set of published data (N = 29). The model for the temperature dependence is derived from kinetic theory of reactions, and the model for the dependence on water content is based on the mechanics of glass formation. The resulting equation is:

$$k = \exp[36.29 - (10005 - 354*w)/T], \quad (3)$$

where k is hydration rate in μ^2/1000 years, w is H_2O_t in wt.%, and T is temperature in Kelvins. The equation gives valid hydration rates for archaeological temperatures, with $R^2 = 0.9998$ and accuracy ≈ 0.3427 μ^2/1000 years, one-sigma (N = 6). The range of structural water values used in the fit is $0.1 < w < 1.02$ wt% and the form of the equation conforms with expectations based on the

Specimen	Source (XRF)	$\%H_2O_t$, wt.%	Hydration rate, μ^2/1000 yrs at 20°C
30	Lookout Mtn.	0.4055	14.1598
36	Lookout Mtn.	0.3490	13.2258
23	Lookout Mtn.	0.3480	13.2098
9	Lookout Mtn.	0.3625	13.4424
16	Lookout Mtn.	0.4789	15.4717
17	Sawmill Ridge	0.3595	13.3941
18	Sawmill Ridge	0.3558	13.3346
20	Sawmill Ridge	0.3474	13.2008
29	Sawmill Ridge	0.4241	14.4818
8	Sawmill Ridge	0.2751	12.0969

Table 4. Casa Diablo obsidian hydration rates.

physics of hydration. The wide range of temperatures in the data set (20°C to 180°C) provides a solid basis for verifying the form of the temperature variation. Applying equation (2) to the data set of Table 4 gives the hydration rate in Table 5 where a temperature of 20°C was used.

The hydration rate statistics for these two sub-sources are, at a temperature of 20°C: (N = 5); Sawmill Ridge 13.30 ± 0.86 μ^2/1000 yrs. (N = 5). A t-test yields t = 1.05, so the difference in hydration rate for the two sub-sources is not statistically distinguishable at the 95% confidence level (threshold = 1.96). A composite value for the hydration rate is 13.60 ± 0.91 μ^2/1000 yrs. (N = 10), with a coefficient of variation of 6.7%.

Discussion and Conclusions

These data show that Casa Diablo obsidian has a moderate H_2O_t content, lying between the "dry" Bodie Hills obsidian (H_2O_t = 0.12 wt.%; Stevenson et al. 2021) and the "wetter" Coso Sugarloaf Mountain obsidian (H_2O_t = 1.01 wt.%, Rogers 2008; Stevenson et al. 1993). Surprisingly, although obsidian specimens from the Sawmill Ridge and Lookout Mountain sub-sources are geochemically distinct (Hughes 1994) the structural water content of the two sub-sources is not. The same is true for the hydration rates, and the use of a composite rate of 13.60 ± 0.91 μ^2/1000 yrs. at 20°C is statistically justified. Further, this rate agrees well with the previously derived rate of 12.87 ± 1.50 μ^2/1000 yrs. at 20°C, which was based on archaeological data and a very small sample size (Rogers 2017). Finally, it appears that distinguishing the sub-sources is not necessary for chronometrics, although it may be useful for studies of obsidian trade and exchange (see Eerkens and Rosenthal 2004).

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ABOUT OUR WEB SITE

The IAOS maintains a website at http://www.deschutesmeridian.com/IAOS/ The site has some great resources available to the public, and our webmaster, Craig Skinner, continues to update the list of publications and must-have volumes.

You can now become a member online or renew your current IAOS membership using PayPal. Please take advantage of this opportunity to continue your support of the IAOS.

Other items on our website include:

- World obsidian source catalog
- Back issues of the *Bulletin.*
- An obsidian bibliography
- An obsidian laboratory directory
- Photos and maps of some source locations
- Links

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ABOUT THE IAOS

The International Association for Obsidian Studies (IAOS) was formed in 1989 to provide a forum for obsidian researchers throughout the world. Major interest areas include: obsidian hydration dating, obsidian and materials characterization ("sourcing"), geoarchaeological obsidian studies, obsidian and lithic technology, and the prehistoric procurement and utilization of obsidian. In addition to disseminating information about advances in obsidian research to archaeologists and other interested parties, the IAOS was also established to:

1. Develop standards for analytic procedures and ensure inter-laboratory comparability.
2. Develop standards for recording and reporting obsidian hydration and characterization results
3. Provide technical support in the form of training and workshops for those wanting to develop their expertise in the field.
4. Provide a central source of information regarding the advances in obsidian studies and the analytic capabilities of various laboratories and institutions