# Joint Rendezvous of the Wyoming Archaeological Society and Rocky Mountain Anthropological Association


## Program and Abstracts

**Conference Logo/Cover Art by Tyson Arnold**

ROCKY MOUNTAIN ANTHROPOLOGICAL ASSOCIATION

Laramie, Wyoming
May 2nd-5th, 2024

# Hosts

This meeting is hosted by the June Frison Chapter of the Wyoming Archaeological Society (WAS) and the Rocky Mountain Anthropological Association (RMAA) at the Hilton Garden Inn and University of Wyoming Conference Center.

# Conference Schedule

**Thursday, May 2nd, 2024**

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|---|---|
| 3:00 pm - 6:00 pm | Conference Registration, Grand Ballroom Lobby |
| 3:00 pm - 5:00 PM | Wyoming Association of Professional Archaeologists (WAPA) Biannual Business Meeting, Salons G/F |
| 5:00 PM - 8:00 PM | Early Bird Social, Grand Ballroom |

**Friday, May 3rd, 2024**

| | |
|---|---|
| 8:00 am - 4:00 pm | Conference Registration, Grand Ballroom Lobby |
| 8:00 am - 4:00 pm | WAS Silent Auction, Salon A |
| 8:00 am - 4:00 pm | Vendor Tables, Salon B |
| 8:00 am - 4:00 pm | RMAA Presentations, Salon C |
| 8:00 am - 4:00 pm | RMAA Presentations, Salon D |
| 8:00 am - 12:00 pm | In-person Poster Session, Salon E |
| 4:00 pm - 5:00 pm | RMAA Business Meeting, Salons G/F |
| 5:30 pm - 7:30 pm | Anthropology Building Social, George C. Frison Building (Sponsored in part by Northridge Liquor and Nate Fleming (TRC)) |
| 6:30 pm - 7:00 pm | Mary Lou Larson Bench Dedication |

**Saturday, May 4th, 2024**

| | |
|---|---|
| 8:00 am - 3:00 pm | Conference Registration, Grand Ballroom Lobby |
| 8:00 am - 3:00 pm | WAS Silent Auction, Salon A |
| 8:00 am - 4:00 pm | Vendor Tables, Salon B |
| 7:30 am - 9:00 am | Wyoming Archaeological Society (WAS) Business Meeting, Salons G/F |
| 9:00 am - 4:00 pm | WAS Symposium, Salon C |
| 9:00 am - 4:00 pm | Presentations, Salon D |
| 8:00 am - 4:00 pm | Posters displayed, Salon E |
| 12:00 pm - 1:30 pm | WAS Scholarship Committee, Wyoming's Rib & Chop House |
| 5:00 pm - 6:00 pm | Evening Social, Grand Ballroom |
| 6:00 pm - 8:00 pm | Banquet & Keynote Speaker, Grand Ballroom |

**Sunday, May 5th, 2024**

| | |
|---|---|
| 7:30 am - 9:00 am | Wyoming Archaeological Foundation (WAF) Business Meeting: Perkins |
| 9:00 am - 12:00 pm | Field Trip to Sherman Townsite & Ames Monument: Meeting Location, UW Conference Center Parking Lot |

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# General Information

**Meeting Location**
All presentations, posters and meetings will be held at the Hilton Garden Inn and University of Wyoming Conference Center (2221 Grand Avenue, Laramie, WY 82070)

**Registration**
On-site registration is available for those who have not registered with the conference early. Prices for registration is $50 for students and $80 for professionals/non-students.

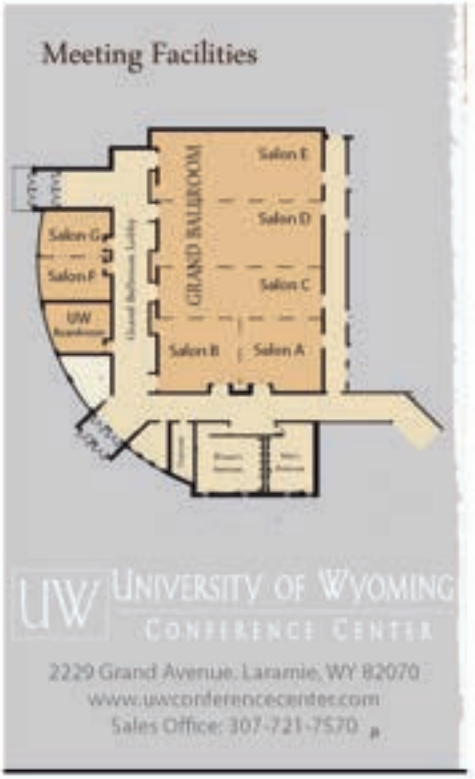
**Socials**
There will be two social events. On Thursday, an early bird social will be held in the Grand Ballroom of the Hilton Garden Inn and University of Wyoming Conference Center from 5:00 to 8:00 pm. Wine, beer and appetizers will be provided. Another social will be held at the George C. Frison Building on Friday at 5:30 to 7:30 pm. Wine, beer and appetizers will be provided. This social is sponsored by Northridge Liquors and Nate Fleming (TRC).

**Paper and Poster Presentations**
All paper presentations will be held in Salon C and D on Friday and Saturday. Please refer to the conference schedule for more information. Posters will be set-up at the beginning of the conference in Salon E and will be left up for the duration of the conference. We will host a single general poster session on Friday morning for presenters to stand next to their posters. We will provide easels and boards to mount posters. If your poster is part of a symposium, please group them together in Salon E.

**Silent Auction**
The WAS annual silent auction will be held in Salon A. Bidding will begin on Friday morning at 8:00 am and closes at 4:00 pm Saturday afternoon. All items must be paid for by cash or check and picked up before 5:15 pm. All proceeds from the Silent Auction will go to the June Frison Chapter of the Wyoming Archaeological Society.

# Map for Hotels

# Conference Center Map




# Field Trip Information

This year's field trip will visit multiple sites associated with the Union Pacific Railroad including the Ames Monument, the Sherman Townsite and other locations. Two UW vans will be available. Meet in the conference center parking lot at 9:00 am. The schedule for the fieldtrip is below:

9:00 - 9:30: Travel via I-80 to Ames Monument

9:30 - 10:00: Tour Ames Monument and Mary Hopkins and Christina Bird will interpret

10:00 - 10:30: Tour Sherman townsite roundhouse and cemetery. Dr. Spencer Pelton will talk about the townsite.

10:30 - 11:00: Travel from Sherman to Tie Siding via Hermosa Road paralleling original train tracks. Pause by Dale Cr. Bridge to talk about it. Pause right before Tie Siding to see rail grade and interpret Tie Siding.

11:00 - 11:30: Travel to Cavalryman to interpret Fort Sanders

11:30-12:00: Return to hotel

# Banquet Information

The Wyoming Archaeological Society is hosting a banquet as part of it's annual meeting. Tickets for the banquet must be purchased in advance and are $36. A cash bar will be available to purchase alcohol, wine and beer.

Banquet Tickets are required to eat but not required to listen to the talk. Your badge will come with a banquet ticket in it's lanyard, A limited amount of banquet tickets will be available for purchase for those doing on-site registration.

This year we are very excited to have Dr. Kelly Graf as our Keynote Speaker after Saturday night's Banquet. Dr. Graf will be speaking about her work in the peopling of the Americans research. An abstract for her talk is below.

# Abstract

Traditionally, peopling of the Americas studies focused on questions of when and from where initial human migration to the Western Hemisphere took place. Researchers have argued for arrival as early as before the last glacial maximum (LGM) to as late as 14,000-13,000 years ago, coinciding with the origins of the Clovis archaeological tradition, and for a founding population from Northeast Asia, Southeast Asia, or even Europe with people crossing the Bering Land Bridge, skirting the Pacific coasts, and/or boating across the Pacific and Atlantic oceans. New developments in ancient human genomic studies provide a framework for better understanding the tempo and geography of first peoples' arrival. Documentation of several paleogenomes from late Pleistocene and early Holocene contexts indicate an initial migration from Siberia through Beringia to the Americas. Here, we will explore the archaeological record of Siberia and Beringia within a paleogenomics context to help fill in gaps in our understanding of the dispersal process to the Americas.

# Keynote Speaker Bio

**Bio:**
Kelly Graf received a B.S. degree in Anthropology and Geology from Missouri State University in 1995. She received her M.A. degree in Anthropology from the University of Nevada, Las Vegas in 2001 and her Ph.D. degree in Anthropology from the University of Nevada, Reno in 2008. In 2008, she joined colleagues in the Center for the Study of the First Americans at Texas A&M University, serving as a research affiliate with the CSFA, and then in 2013 she was hired in a tenure-track position TAMU, earning tenure in 2017. In 2022, she was invited to join her colleagues in Anthropology at the University of Kansas.

In addition to the study of the peopling of Siberia and Beringia, her research interests focus on human adaptations in extreme northern and arid environmental settings and human response to extreme climatic oscillations, for example the Siberian last glacial maximum and rapid climatic upheavals at the Pleistocene-Holocene boundary in Alaska, Great Basin, and far southern Patagonia. As an environmental archaeologist, she uses geoarchaeology and the study of lithic technological organization to learn about human adaptations in these contexts. Since 2008, Kelly has directed three excavations of terminal Pleistocene-aged sites in Alaska (Owl Ridge, Dry Creek, and currently Shég' Xdaltth'i'), and with colleagues she has co-directed excavations at several additional sites in Nevada, Utah, Alaska, Russia, and Argentina. She has taken more than 150 undergraduate and graduate students with her to the field. Several students have co-authored conference presentations and peer-reviewed journal articles and book chapters with her, reporting results of these projects. She also values working with descendant communities, involving them in her research.

# Poster/ Paper Schedule

## Friday Morning May 3rd

**Poster Session (Friday, May 3rd 8:00-12:00) - Salon E**

**Utilizing Digital Elevation Models to Analyze Use-wear on Folsom Ground Stone**
Lance R. Anderson (Eastern New Mexico University)

**Pre-contact Stone Paint Palettes from the Bighorn Basin**
Michael T. Bies (O W Heritage Research), Barrie Lynn Bryant (Arapaho Ranch Field Station) and Alexandra Deselms (Meeteetse Museum)

**A Tale as Old as Excavation: Bonding at Hell Gap National Historic Landmark**
Dakota R. Buhmann (University of Wyoming)

**Traditional Ecological Knowledge, Indigenous Women, and Traditional Fire Practices in the Far North**
Kassandra Dutro, Casey Black and Briana Doering (University of Wyoming)

**FactorEarth™ Record: An All-In-One Digital Form Solution**
Jessica Ericson (Metcalf Archaeological Consultants)

**Ritual or Everyday Use: Application of Digital Photogrammetry for Use-Wear Analysis of Hell Gap Ground Stone**
Lauren K. Griego (Eastern New Mexico University)

**An Analysis of Organic Materials from an Ice Patch**
Colin King (Montana State University)

**Integrating the Hell Gap Ground Stone Assemblage into the Folsom technology at Locality I**
Marcel Kornfeld (University of Wyoming) and Elizabeth M. Lynch (Eastern New Mexico University)

**Examining the Isotopic Signatures of Late Pleistocene and Early Holocene Hearth Features from the Bachner Site (XBD-155) near Quartz Lake, Alaska**
McKenna Litynski, Gideon Buchanan and and Casey Black (University of Wyoming)

**From Greenland to The Rocky Mountains: How Two-Eyed Seeing Informs Identities of Places through Toponyms**
Agnes Macy (Bowdoin College) and Joey Lancia (Central Wyoming College)

**Hunting Preferences In Archaic Period Housepits In Central Wyoming Using The Artiodactyl Index**
Fox Nelson (University of Wyoming)

**Insight into Holocene Wyoming Bison Population History with Ancient Genomes**
Jonas Oppenheimer (University of California, Santa Cruz), Lawrence Todd (GRSLE), Richard E. Green (University of California, Santa Cruz), Gregg P. Adams (University of Saskatchewan), Greg A. Wilson (Parks Canada Agency) and Beth Shapiro (University of California, Santa Cruz)

**Chasing the Pleistocene at Hell Gap Locality IV**
Spencer R. Pelton (Office of the Wyoming State Archaeologist), Marcia Peterson (Office of the Wyoming State Archaeologist), Scott Wheeler (University of Wyoming) and Carlton Shield Chief Gover (The University of Kansas)

**Revisitng Krmpotich: Folsom Flutes and Manufacturing Idiosyncrasies**
Michael R. Peterson (US Forest Service) and Marcel Kornfeld (University of Wyoming)

**Investigating Human Mobility in the High Alpine through Strontium Isotope Analysis**
Amy Phillips (St. Cloud State University)

**New Approaches in Optical Dating of Archaeological Rock Surfaces: The Gunnison Basin Case Study on Lithic Surface Artifacts**
Noah Powell (University of Oklahoma), Michael Meyer (University of Innsbruck), Bonnie Pitblado (University of Oklahoma), Loic Martin (University of Innsbruck) and Christopher Merriman (Adams State University)

**Charcoal Identification and Analysis from Sister Hill Paleoindian Site (48JO314)**
Haley Purifoy (University of Wyoming)

**From Archaeology to Paleontology: Giant Ground Sloth from the Hell Gap Site, Wyoming**
Rachael Lea Shimek (Office of the Wyoming State Archaeologist) and Marcel Kornfeld (University of Wyoming)

**Exploring Rock Art Site Location in the Bighorn Basin: A Spatial Analysis of Social Conductance and Least-Cost Modeling**
Ann-Marie Stephens (Wyoming Cultural Records Office, University of Wyoming)

**Testing the use of lichen cover on rock lines associated with a prehistoric hunting site (bison jump) in NW Wyoming to date their construction**
Cadence Truchot (Utah State University), Emma Krolczyk (Utah State University), Tammy Rittenour (Utah State University) and Todd Guenther (Central Wyoming College)

**Expanding our Understanding: Insights From the Hell Gap 2023 Field Season**
Clifford White (University of Wyoming), Brianna Houghton (University of Wyoming), Dakota Buhmann (University of Wyoming), Joel T. Collie(University of Bahamas), Rachael L. Shimek (Office of the Wyoming State Archaeologist), Lucille Holt (University of Wyoming), Camden Shakespeare (University of Bahamas) and Marcel Kornfeld (University of Wyoming)

## Symposium: Other Side of the Tracks: Historical Archaeology of Railroad Communities in Utah and Wyoming (Friday, May 3rd: 9:00-11:40) - Salon C

Session Chair - Chris Meritt

**9:00-9:20: Terrace, Utah: Population 0**
Christopher W. Merritt (Utah State Historic Preservation Office) and Michael Sheehan (Salt Lake Field Office, Bureau of Land Management)

**9:20-9:40: Section Camps and Laborers, Chinese and Japanese Railroad Workers in Southern Wyoming 1868 to 1942**
A. Dudley Gardner (Western Wyoming College) and Laura Ng (Grinnell College)

**9:40-10:00: Fishy Things: Chinese Trade Networks and Connections Across the American West**
Ryan Kennedy (Indiana University)

**10:00-10:20: Material and Spatial Practices of Labor, Identity, and Heritage at Carbon, Wyoming**
Alexandra Kelly and Jason Toohey (University of Wyoming)

**10:20-10:40: Break**

**10:40-11:00: Chinese Railroad Worker Interments and Cemeteries in Utah**
Michael R. Polk (Aspen Ridge Consultants, L.L.C.)

**11:00-11:20: What Happens When the Coal's Gone? Shaping Labor Memory in Kemmerer-Diamondville's Coal Mining Community. Aubrey Edwards (University of Wyoming)**

**11:20-11:40: Mapping Community along the Transcontinental Railroad: A Case Study from Box Elder County, Utah**
By Molly Boeka Cannon and Kenneth P. Cannon (Cannon Heritage Consultants)

## Friday Afternoon May 3rd

### Symposium: Climate Change and Rocky Mountains Archaeology (Friday, May 3rd: 1:20-3:40) - Salon C

Session Chairs - Lawrence Todd and Marcia Peterson

**1:20-1:40: Anticipating the Unpredictable: Post-Fire Archaeological Documentation and Next-Fire Planning**
Lawrence Todd (GRSLE)

**1:40-2:00: Results of the Medicine Bow National Forest Post-Mullen Fire Survey**
Marcia Peterson (Office of the Wyoming State Archaeologist)

**2:00-2:20: Five Feet High and Rising: Impacts to Archeological Resources from the 2022 Historic Flood at Yellowstone National Park**
Beth Horton (Yellowstone National Park)

**2:20-2:40: Break**

**2:40-3:00: The Effects of Climate Change on Grand Teton Cultural Resources: A Research Design**
Randall Haas (University of Wyoming), JP Schubert (Grand Teton National Park) and Marcia Peterson (Office of the Wyoming State Archaeologist)

**3:00-3:20: Our Disappearing, Frozen Archives – Ice Patch Repositories in North America**
David Christianson (University of Wyoming), Nathan Chelman (University of Nevada, Reno), Craig Lee (Montana State University), Joe McConnel (University of Nevada, Reno), Dave McWethy (Montana State University) and Greg Pederson (U.S.G.S. Northern Rocky Mountain Research Center)

**3:20-4:00: Discussion**

## General Session Papers (Friday the 3rd, 1:20-4:00) - Salon D

Session Chair - Aaron Whittenburg

**1:20-1:40: A Bison Tale: The Western Colorado Bison Project. Evidence of Prehistoric Bison Hunting Specific to Western Colorado**
H. "Sonny" Shelton (Dominquez Archaeological Research Group)

**1:40-2:00: Two Conical Wooden Structures' Excavation**
Carl Conner (Dominquez Archaeological Research Group)

**2:00-2:20: Factors Governing the Use of Exterior Space in Montane Campsites of Dukha Reindeer Herders**
Todd A. Surovell (University of Wyoming)

**2:20-2:40: Break**

**2:40-3:00: A Preliminary Characterization of Osseous Foreshafts from Yukon Ice Patches.**
Christian Thomas and Holly Smith (Yukon Government)

**3:00-3:20: Hunting the Colorado High Country: Results from the James Peak Wilderness Archaeological Project**
Aaron Whittenburg (Metcalf Archaeological Consultants)

**3:20-3:40: Preliminary Results of Mitigative Excavations at the Twin Tunnels Site (5CC389), a Multi-Component Campsite Along Clear Creek Near Idaho Springs**
Travis Bugg, Christopher Kinneer, Benjamin F. Perlmutter, Kristin A. Gensmer, Bryn Sullivan, Kaeleigh Ray, Michelle A. Dinkel and Caden Hooker (Centennial Archaeology LLC)

**3:40-4:00: Thermal Features, Pollen, and Charcoal: What's the Record?**
Linda Scott Cummings and R. A. Varney (PaleoResearch Institute)

## Saturday Morning May 4th

### Symposium: Sites Without Borders: Evaluating the Role of Surface Scatters and Shallow Sites in Models of Forager Technology and Mobility (Saturday May 4th: 9:00-12:00) - Salon D

Session Chairs - Kelton A. Meyer and Chase M. Mahan

**9:00-9:20: Making Sense of Time and Space in a 'Noisy' Surface Scatter at the Reddin Site, San Luis Valley, Colorado.**
Kelton A. Meyer (Colorado State University)

**9:20-9:40: Structure and Formation Processes of Open-Air Lithic Scatters**
Kenneth L. Kvamme (University of Arkansas)

**9:40-10:00: Lithic Landscapes: Management and Study of Ubiquitous Surface Lithic Material**
Connor C. Johnen and Damian R. Kirkwood (Wyoming Cultural Records Office)

**10:00-10:20: Transconceptual Archaeology in NW Wyoming: Working Toward An Integrated Research Program**
Lawrence Todd (GRSLE)

**10:20-10:40: Break**

**10:40-11:00: One Cell at a Time: Uncovering the Many Visitors to the Forest Canyon Pass Site (5LR2), Colorado**
Jason M. LaBelle, Aleah G. Kuhr and Kelton A. Meyer (Colorado State University)

**11:00-11:20: Indigenous Camp Structure and Territorial Boundaries at the Demijohn Archaeological District of the Pryor Mountains**
Cole Wandler (Barron Cultural Resource Consultants), Samuel Yeates (Barron Cultural Resource Consultants) and Blake Griffin (Wyoming Military Department)

**11:20-11:40: Eocene Chert of the Wyoming Basin: A Case Study from the Great Divide Paleoindian Surveys**
Chase M. Mahan (University of Wyoming) and Spencer R. Pelton (Office of the Wyoming State Archaeologist)

**11:40-12:00: Folsom Obsidian Conveyance at the Great Divide Paleoindian Sites, Wyoming**
Spencer R. Pelton (Office of The Wyoming State Archaeologist), Chase M. Mahan (University of Wyoming) and Bill Scoggin

## WAS Symposium (Saturday, May 4th: 9:00-4:00) - Salon C

Session Chair - Marcia Peterson

**9:00-9:20: Carved in Stone: Utilizing an "On-The-Fly" 3D Model to Describe and Interpret the Rock Art Panels Found at Trinchera Cave**
Jaimie Adams (University of Wyoming)

**9:20-9:40: 2019 Archaeological Testing of the 1879 Waterwheel and Associated Ditch at Fort Laramie National Historic Site, Wyoming**
Danny N. Walker (University of Wyoming) and Sylvia Huber (Sylvia Pro.D Consult)

**9:40-10:00: Where is the Bone? The Use of Phosphorus to Determine Evidence of Bone on a Possible High Elevation Bison Jump in the Wind River Mountains, Wyoming**
Morgan W. Robins (Rock Springs Field Office, Bureau of Land Management)

**10:00-10:20: The Ice Patch Village Site: A Long-term High Elevation Occupation in the Wind River Mountains, Wyoming.**
Todd Guenther and Hannah Nelson (Central Wyoming College)

**10:20-10:40: Break**

**10:40-11:00: Nothing Else Like It: The Wiggins Fork Bison Jumps Complex, an Engineered Communal Hunting Landscape in Wyoming's Greater Yellowstone Ecosystem.**
**Bojura niah doyahavi noodagant – "Buffalo Falling Off the Mountain" (Baldes 2023).**
Todd Guenther (Central Wyoming College), Kenneth P. Cannon (Cannon Heritage Consultants), William Eckerle (Cannon Heritage Consultants), Tammy Rittenour (Utah State University), Emma Krolczyk (Utah State University) Hillary Jones (Worland Field Office, Bureau of Land Management), Crystal Reynolds (Northern Arapaho Tribal Historic Preservation Office) and Hannah Nelson (Central Wyoming College)

**11:00-11:20: Geoarchaeological Investigation of Kill Locus 4 at the Wiggins Fork Bison Kill Complex (Site 48FR7470), Fremont County, Wyoming**
William Eckerle (Cannon Heritage Consultants) and Hillary Jones (Worland Field Office, Bureau of Land Management)

**11:20-11:40: Wiggins Fork by the Numbers**
Kenneth P. Cannon (Cannon Heritage Consultants)

**11:40-12:00: Fort Antonio: Investigations at an 1830s Apsáalooke Trading Post on the Powder River, Wyoming**
Cody Newton (SWCA Environmental Consultants, Inc.)

**12:00-1:40: Lunch**

**1:40-2:00: Reevaluating Clovis Diets: Microfauna Analysis at the La Prele Mammoth Site (48CO1401)**
McKenna L. Litynski (University of Wyoming)

**2:00-2:20: An Update on the Conjoined Artifacts from the La Prele Mammoth Site (48CO1401), Wyoming**
Paul H. Sanders and Todd A. Surovell (University of Wyoming)

**2:20-2:40: Can Human Presence at Proboscidean Sites be Shown Through Site Taphonomy and Spatial Artifact Distribution? Case Study of Applied Methods on the Warren Mammoth Site**
Mackenzie DePlata Peterson (University of Wyoming)

**2:40-3:00: Break**

**3:00-3:20: To Hell Gap and Beyond: Expanding Timeframes and Insights into Paleoindian Artifacts**
Clifford White and Marcel Kornfeld (University of Wyoming)

**3:20-3:40: It's a Numbers Game: Summary Statistics of Archaeological Sites and Surveys in Wyoming**
Connor C. Johnen (Wyoming Cultural Records Office)

**3:40-4:00: Paleoindian Projectile Points from Wyoming**
David Kolkema (University of Wyoming)

# Saturday Afternoon May 4th

## Symposium: Bill Fest: Papers in Honor of Bill Eckerle (Saturday, May 4th: 1:40-3:40) - Salon D

Session Chair - Kenneth P. Cannon

**1:40-2:00: From the High Rises of Pittsburgh to the Sand Dunes of Wyoming: A Celebration of the Career of William 'Bill' Eckerle**
Kenneth P. Cannon (Cannon Heritage Consultants), Margo Taylor (Western GeoArch Research) and Molly Boeka Cannon (Cannon Heritage Consultants)

**2:00-2:20: Full Circle: Bill Eckerle, the Middle Fork of the Powder River, Geoarchaeology, and Rock Art**
Julie Francis (University of Wyoming ), Larry Loendorf (Sacred Sites Research, Inc.) and Spencer Pelton (Office of The Wyoming State Archaeologist)

**2:20-2:40: Three Thousand Years of Pine Nut Camps in the Modena/Panaca Obsidian Source Area in Southwestern, Utah**
Heidi Roberts (HRA Archaeology), Keith Hardin (HRA Archaeology), William Eckerle (Cannon Heritage Consultants) and Andrea Brunelle (University of Utah)

**2:40-3:00: Life & Death in the Powder River Basin, or Bill Eckerle: The Haagen Dazs Hero.**
Todd Guenther (Central Wyoming College)

**3:00-3:40: Thoughtful Comments and Appreciation**
Eric Ingbar (Gnomon, Inc.)

Hillary Jones (Worland Field Office, Bureau of Land Management)

Ardy Hahn (Buffalo Field Office, Bureau of Land Management)

Molly Boeka Cannon (Cannon Heritage Consultants)

Steve Aaberg (Aaberg Cultural Resources)

# Session Abstracts

**Climate Change and Rocky Mountain Archaeology**
Organizers: Lawrence Todd (GRSLE) and Marcia Peterson (Office of the Wyoming State Archaeologist)

Archaeological research has a rich history of contributing to a comprehensive and multidisciplinary approach to understanding climate change's impacts on mountain ecosystems at various spatial and temporal scales. The subject of change has gained a new dimension in contemporary research that includes studies related to topics such as the recent intensification of rates of melting ice patches, unprecedented forest fires, and massive flooding events. This session aims to provide an overview of 21st-century research on the impact of past and current climate changes in the Rocky Mountains, and how this understanding can help address present challenges, enabling new research topics and approaches.

**Sites without Borders: Evaluating the Role of Surface Scatters and Shallow Sites in Models of Forager Technology and Mobility**

Organizers: Kelton A. Meyer (Colorado State University) and Chase M. Mahan (University of Wyoming)

Archaeologists favor the study of well-stratified or deeply buried sites based on the pretense that such deposits offer the clearest picture of past events. Traditionally, surface scatters and shallowly buried sites have played a smaller role in models of forager technology and mobility, even though these resources make up a larger majority of the archaeological record. Our symposium brings surface scatters and shallow sites into focus and directly addresses their analytical utility for archaeologists. We bring together researchers who are developing effective sampling strategies, quantitative spatial methods, as well as new theories aimed at redefining the significance of sites with questionable chronological and spatial control. Our goal is to demonstrate that sites with complex surface arrangements of artifacts and features, which accumulated across longer time frames, are solutions to specific questions about forager activity patterns, technology, and land use – rather than problems to be ignored by traditional research approaches.

# Paper Abstracts

**Carved in Stone: Utilizing an "On-The-Fly" 3D Model to Describe and Interpret the Rock Art Panels Found at Trinchera Cave**

Jaimie Adams (University of Wyoming)

Anthropologists' growing adoption of close-range photogrammetry (CRP) in recent years offers new perspectives in interpreting past symbolic behavior, particularly in rock art imagery analysis. The evolving technological landscape necessitates the understanding of how CRP procedures for creating 3D models can help Archaeologists perform rigorous rock art interpretations. Prior research employed a CRP dataset curated by students at Trinchera Cave in Southeastern Colorado. This site boasts bedrock ground stone features and rock art panels dating from the Early Archaic to Pre-Historic eras. The research aimed to create a functional 3D model using unconventional photogrammetric methods known as On-The-Fly (OTF), which involved makeshift target boards and suboptimal photo overlapping. Remarkably, this endeavor was successfully accomplished, facilitating more efficient scholarly examination of Trinchera Cave rock art. In the present study, the 3D model derived from the OTF dataset serves as a pivotal tool for the description and interpretation of the rock art panels versus the considerably more time-consuming manual recording methods. Achieving successful interpretations with this OTF 3D model promises to advance rock art research capabilities, elevate digital preservation methodologies, expand cultural resource protection efforts, foster increased public engagement with rock art, and improve overall accessibility to this cultural heritage.

**Preliminary Results of Mitigative Excavations at the Twin Tunnels Site (5CC389), a Multi-Component Campsite Along Clear Creek Near Idaho Springs**

Travis Bugg, Christopher Kinneer, Benjamin F. Perlmutter, Kristin A. Gensmer, Bryn Sullivan, Kaeleigh Ray, Michelle A. Dinkel and Caden Hooker (Centennial Archaeology LLC)

In 2023 Centennial Archaeology conducted mitigative excavations at the Twin Tunnels Site (5CC389) overlooking Clear Creek east of Idaho Springs as part of the CDOT Floyd Hill Project. It was originally investigated by CDOT in 1988/1989. Testing revealed charcoal-laden soil, projectile points, lithics, bone, and pottery fragments. To mitigate unavoidable impacts, Centennial excavated a total of 44 1m2 excavation units. While analysis is ongoing, this paper provides a preliminary summary of the findings of the excavation. Projectile points indicate repeated reoccupations spanning the Early Archaic through the Middle Ceramic periods, with a particularly robust Early Ceramic period component. Recovered materials include flaked stone tools, debitage, ground stone, pottery fragments, bone, and thermal features. A historic component contains structural and domestic artifacts and a large faunal assemblage. Excavated stratified sites are uncommon in the mountains and 5CC389 provides an important window into the prehistoric mobility and settlement patterns, and subsistence strategies in a transitional environment between the plains and the high country.

**From the High Rises of Pittsburgh to the Sand Dunes of Wyoming: A Celebration of the Career of William 'Bill' Eckerle**

Kenneth P. Cannon, Molly Boeka Cannon (Cannon Heritage Consultants) and Margo Taylor (Western GeoArch Research)

This symposium is organized to celebrate Bill's contribution to western United States archaeology and to thank him for his mentoring and friendship. Bill was academically and professionally trained at the Universities of Idaho, Wyoming, Utah, and Montana State Universities in archaeology, geology, soil science and anthropology. Over his five-decade (and counting) career, Bill has collaborated with some of the foremost archaeologists and Quaternary scientists in the western United States. Work at over 600 sites in 12 states has allowed Bill to become a leader in geoarchaeological studies. Beyond geoarchaeology, Bill has developed climate and burial modeling expertise to understand the exciting interplay between human behavior, climate, and geology. Bill's holistic view of the archaeological record provided many of us with a much more robust understanding of the archaeological record.

**Wiggins Fork by the Numbers**
Kenneth P. Cannon (Cannon Heritage Consultants)

The Wiggins Fork Bison Jump complex represents late Prehistoric bison kill events but may have a deeper history. Although there have not been any controlled excavations, recovery of specific elements from an exposed cutbank (2020) and backhoe trenching (2023) provides an opportunity to explore specific topics of demography and ecology in relation to other Wyoming complexes. This poster will present demographic data based on recovered bison mandibles and post-cranial elements. Stable isotope data will also be presented in relation to past climate histories.

**Mapping Community along the Transcontinental Railroad: A Case Study from Box Elder County, Utah**
Molly Boeka Cannon and Kenneth P. Cannon (Cannon Heritage Consultants)

Transcontinental Railroad scholarship experienced renewed interest with the sesquicentennial in 2019; scholarship now aimed at deconstructing tired narratives and tropes of American exceptionalism and examining the legacy of Manifest Destiny for indigenous and immigrant communities, environmentalism, and community formations throughout the American West. In Utah, the State Historic Preservation Office, Bureau of Land Management, academics, and professional archaeologists focused on documenting diverse cultural experiences of railroad construction and its impacts on communities. Through a series of federally and state-funded programs, archaeology along the Transcontinental Railroad in Box Elder County, Utah, documented land use and community organization through surface surveys that uncovered artifacts, structures, and remnants of human activity associated with the construction and operation of the railroad, resulting in a robust material culture dataset representing many uses of the landscape, including the establishment of temporary worker camps, townsites, cemeteries, trestles, culverts, and other infrastructure. In this paper presentation, we report on geospatial analyses that utilize this dataset and ground-based remote sensing technology to investigate the impact of the railroad's construction and operation on community structure at Bovine, Matlin, and Terrace.

**Our Disappearing, Frozen Archives – Ice Patch Repositories in North America**

David Christianson (University of Wyoming), Nathan Chelman (University of Nevada, Reno), Craig Lee (Montana State University), Joe McConnel (University of Nevada, Reno), Dave McWethy (Montana State University) and Greg Pederson (U.S.G.S. Northern Rocky Mountain Research Center)

The alpine of the Rocky Mountains hold a vast repository of organic ecological, climatological, and anthropogenic material spanning the past 10,0000 years. These archives are held in stationary, layered ice patches that are appear to have been relatively stable over thousands of years. Artefacts are often found in and around these patches alongside organic material including herbivore feces, plant material, and chemical signatures in the ice itself. These materials collectively describe not only climate – but also ecological communities around these ice patches throughout the Holocene. Interdisciplinary research is focused on describing how climate, plants, and animals interact with ice patches today as well as recovering ancient ice and organic material before these resources disappear in the warming climate at high elevations.

**Two Conical Wooden Structures' Excavation**

Carl Conner (Dominquez Archaeological Research Group)

Excavations at sites in western Colorado have demonstrated techniques in the identification and retrieval of data from near-surface conical wood-pole structures utilized by hunter-gatherer groups. At 5RB8902, located near Meeker, a lodge floor defined by pole impressions was exposed by simply brushing away aeolian surface soils. Exposed on the floor were moccasin and foot impressions, as well as a seating area and an apparent sleeping position. A small interior thermal feature was AMS 14C dated 1700 years old. A nearby site containing Avonlea Complex diagnostic artifacts and a thermal feature of the same date indicate the presence of this bison hunting tradition in NW Colorado. At another site located near Hotchkiss, distribution of surface artifacts at 5DT.2722 indicated the potential presence of a lodge feature. Through brushing the surface aeolian deposits from around and within the suspected feature, pole base impressions of a conical superstructure roughly 2.5m in diameter were exposed. Although no thermal feature was discovered, a sample of small pieces of charcoal collected by fine-mesh screening the soil from the floor of the structure was AMS dated Cal. A.D. 1480-1680. This date is indicative of the Early Numic occupation of the region.

**Thermal Features, Pollen, and Charcoal: What's the Record?**

Linda Scott Cummings and R. A. Varney (PaleoResearch Institute)

Although it's tempting to think about thermal features as primarily a record of charred remains, the pollen record can be equally or sometimes more valuable. Understanding the layers and subtleties of thermal features allows for more informed sampling strategies. Thermal features usually contain a fuel layer, which can inform mainly questions about fuel choices. Even non-fuel macrofloral remains may be rare in this layer. Above the fuel layer the macrofloral record might reflect remains that were not removed or recovered after cooking or roasting was complete. Buffering plant layers may be present in roasting pits, but usually not in fire pits. Of course, people spill while processing or cooking. It's important to be able to identify the living surface associated with thermal features because that surface may hold valuable information concerning meal preparation. Then there is the "spill zone" – that portion of the upper inside wall of a thermal feature where food may be dropped. Each of these areas is likely to contain pollen reflecting plants processed. Think about where people would have sat or squatted while using the thermal feature to identify the best areas of the prehistoric living surface or probable "spill zones" to sample. People sit "cross wind" rather than either upwind or downwind from the feature. As thermal features fill after they have been abandoned, the fill is likely to contain pollen representing plants growing in the area, providing environmental information. More targeted sampling is illustrated in this presentation, which includes both suggestions of where to sample and results of previous projects that either suggest or identify cultural activities associated with use of thermal features. Examples range from preparation of medicinal tea made from ephedra to processing annuals to use of a variety of plants that probably constitute a buffering plant layer.

**Geoarchaeological Investigation of Kill Locus 4 at the Wiggins Fork Bison Kill Complex (Site 48FR7470), Fremont County, Wyoming**

William Eckerle (Cannon Heritage Consultants) and Hillary Jones (Worland Field Office, Bureau of Land Management)

Geoarchaeological investigation of Jump 4 at the Wiggins Fork bison kill complex in 2023 characterized bison bone bed geomorphology and stratigraphy. Todd Guenther (Central Wyoming College, CWC) and Kenneth Cannon (Cannon Heritage Consultants) supervised systematic archaeological recovery during testing. A backhoe trench excavated as part of the CWC 2023 field season provided a geological exposure allowing the creation of a measured cross-section profile of the trench wall. The landform immediately below the jump-off slope shoulder is a steep veneered with loose gravel. A footslope wedge composed of clast supported cobbly colluvium merges riverward with an alluvial overbank terrace. Bison bone and chipped stone artifacts are buried in footslope and alluvial overbank deposits. Low depositional energy bedded silt and sand buries occupation events within the overbank terrace and indicates minimal post-occupational artifact transport during burial. Krotovina are rare suggesting that bioturbation disturbance is minimal. Charcoal zones are associated with the bone bed. Utah State University (USU) geology masters student Emma Krolczyk collected OSL samples for analysis. USU geology professor/OSL laboratory director Tammy Rittenour assisted the geoarchaeologists by verbally sharing her field observations of the backhoe trench profile and setting. Radiocarbon samples were collected to assist with interpreting the chronostratigraphy

**What Happens When the Coal's Gone? Shaping Labor Memory in Kemmerer-Diamondville's Coal Mining Community.**

Aubrey Edwards (University of Wyoming)

Boom and bust cycles have long characterized the state of Wyoming, where regional populations and economies have ebbed and flowed in tandem with the energy industry. These cycles evoke a spectrum of emotions, from collective hope to anxiety, prosperity to distress. Within this context, the struggle between capital and labor over public memory is palpable, reflecting the ongoing tensions inherent in these economic fluctuations. This qualitative inquiry delves into the consciousness of coal mining communities in Kemmerer-Diamondville, Wyoming, exploring their fear of forgetting and the imperative to remember labor history amidst shifting economic landscapes and a transition to nuclear power. Central to this investigation is the creation of a digital public memory-keeping platform, which serves as a repository for collective memory and lived experiences. Grounded in community participation and informed by oral histories and material culture, this accessible website provides a space for residents to engage with and contribute to the preservation of their labor heritage. By examining labor memory within the context of a transitioning coal-centered economy, this study sheds light on the significance of remembering in the face of economic uncertainty and underscores the importance of community-driven initiatives in preserving the legacy of labor in Wyoming's history.

**Full Circle: Bill Eckerle, the Middle Fork of the Powder River, Geoarchaeology, and Rock Art**

Julie Francis (University of Wyoming ), Larry Loendorf (Sacred Sites Research, Inc.) and Spencer Pelton (Office of The Wyoming State Archaeologist)

Going on 40 years ago, Bill Eckerle began his geoarchaeology career on the Middle Fork of the Powder River in Johnson County, Wyoming. Working closely with John Albanese, Bill identified the local Holocene terrace sequence, completed initial soils studies, and examined site formation processes at several buried archaeological sites in a once-proposed reservoir on Middle Fork immediately downstream from the Red Wall. Nearly 40 years later, and at the behest of Larry Loendorf, Bill once again found himself back at the Red Wall on the same stretch of Middle Fork to investigate the geomorphology of what is now known as the Wold Rock Art District (48JO4513), best known for a concentration of contemporaneous, white-painted hand stencils at three sites. Most of these enigmatic images are accessible from the modern ground surface, but others are stranded over 4 m high. In concert with Spencer Pelton, the 21st century geoarchaeological investigations focused on alluvial chronology, identified significant local erosional episodes, and the timing of major changes in depositional regimes by integrating the 1980s data with modern dating techniques. This facilitated landscape reconstruction in the district over the last several thousand years, the construction of a relative chronology of rock images, and changes in indigenous use of the district.

**Section Camps and Laborers, Chinese and Japanese Railroad Workers in Southern Wyoming 1868 to 1942**

A. Dudley Gardner (Western Wyoming College) and Laura Ng (Grinnell College)

Lives in Railroad Section Camps centered around repairing and maintaining the rail line and being prepared to move at anytime to insure smooth operations of the line. The constant coming and going of locomotives and rail cars meant repairs and maintenance had to be made quickly and often constantly. Section hands were semi nomadic as they were transferred to where-ever repairs were needed. For Chinese and Japanese railroad workers their stability lay in having housing built for them at Section Camps spaced 6 miles apart and beside the rail line. The "Section House" and the space around it became their home and a rich material cultural can still be seen in the areas adjacent to their houses. Their homes were also segregated from other workers in the Section Camp. In this presentation we will provide a generalized description of the material remains at Peru and Evanston to illustrate the differences and similarities of the immigrant communities life-ways at these railroad camps

**The Ice Patch Village Site: A Long-term High Elevation Occupation in the Wind River Mountains, Wyoming**

Todd Guenther and Hannah Nelson (Central Wyoming College)

The remote Ice Patch Village site is located a five-day hike from the trailhead deep in the Wind River Mountains in the Greater Yellowstone Ecosystem. This cluster of at least 14 lodge pads at elevations between 11,750ft/3,581m and 11,200ft/3,414m forms one of the highest prehistoric lodge pad "villages" in Wyoming. Two optically stimulated luminescence samples were collected from each of five lodge pads providing preliminary ages between 9.45+1.01ka and 1.66+0.08ka. The two samples from each lodge vary by ≈2ka probably because the sampled lodges burned repeatedly and were rebuilt on the same locations. The lithic artifact assemblage includes multiple diagnostics from each of the Late Prehistoric, Archaic, and Paleo-Indian Periods, including a problematic possible Clovis base. Shoshone teshoas used in hide processing were recorded buried in a shallow cutbank. Residential areas include debitage scatters suggesting primarily tool-sharpening with concentrations adjacent to, and in burn levels under, lodge pads. Prehistoric people accessed the site via a cairn-lined trail from the canyon floor 1,500ft/457m below. Another similarly aged and sized village is located on that trail. Ice Patch Village was forested in prehistory but is currently 800ft/244m above tree line. Lodges were constructed on stepped terraces that appear to be moraines deposited by an extinct micro-glacier. The glacier has been replaced by a snowfield above the site which continues to attract bighorn sheep, elk, deer, and bears whose ancestors drew prehistoric human hunters. Ice Patch Village is located at the upper limit of the subsistence zone in this part of the Winds.

**Life & Death in the Powder River Basin, or Bill Eckerle: The Haagen Dazs Hero**

Todd Guenther (Central Wyoming College)

I would be dead if it weren't for Bill Eckerle. On the flip side, I wouldn't have almost died at 24 years of age if it wasn't for Bill Eckerle. Being in the hospital in Laramie, and Mayo in Minnesota, and having the world's best doctors tell me that IF I survived, I'd be 30% permanently disabled forever and ever amen wasn't much fun. But one of the first things Bill taught me clear back before those dark days of health crises was that good ice cream improves your quality of life. Letting bygones be bygones, he's a great guy, a great scientist, and has been a dear friend for over forty years. I found my first paleo point – a Scottsbluff – while surveying a long pipeline through the Powder River and Thunder Basins with Bill and worked with him here and there throughout the years. More recently, it's been a joy having him help instruct my field schools the last few summers up at the Wiggins Fork Bison Jumps in the Absarokas. Bill is a guy who understands the relationships between knowledge, good food and crew morale. No matter if you are stranded together in a Gillette, Wyoming, winter camp during a blizzard, got your tonsils out, or are just trying not to die, homemade or Haagen Dazs is the way to go.

**Nothing Else Like It: The Wiggins Fork Bison Jumps Complex, an Engineered Communal Hunting Landscape in Wyoming's Greater Yellowstone Ecosystem**

**Bojura niah doyahavi noodagant – "Buffalo Falling Off the Mountain" (Baldes 2023).**

Todd Guenther (Central Wyoming College), Kenneth P. Cannon (Cannon Heritage Consultants), William Eckerle (Cannon Heritage Consultants), Tammy Rittenour (Utah State University), Emma Krolczyk (Utah State University), Hillary Jones (Worland Field Office, Bureau of Land Management), Crystal Reynolds (Northern Arapaho Tribal Historic Preservation Office) and Hannah Nelson (Central Wyoming College)

The enormous Wiggins Fork Bison Jumps Complex northeast of Dubois, Wyoming, in the Greater Yellowstone Ecosystem consists of miles of interlocking drivelines leading to seven apparent jump sites. The complex may have originated as a large Archaic snowfield hunting site. Optically stimulated luminescence dates one driveline to ≈1,350BP. Surface evidence suggests other drivelines are older. The dated driveline was remodeled at least four times ending ≈650BP. The upper levels of a well-preserved, stratified bone bed at this jump carbon date to ≈500BP +/-100. Deeper levels will be older. Over 130 projectile points recovered during exploratory trenching are identified as possibly Shoshonean. Obsidian points are sourced to far western Wyoming and southern Idaho. Fetal bones indicate winter kills. Two other jumps are likely to contain preserved bone. A US Army explorer rode past the site early in 1860 and wrote that the Shoshones kept the buffalo penned up in the mountains and killed them as needed. The coveted winter campgrounds in the upper Wind River valley, known as yu:'warai ŋgë'wahërt, literally "Warm Valley" in Shoshone, attracted many tribes. Several stone circle sites including three of >30 circles are part of the complex, as is a 1.6km/1mi long prayer / ceremonial area, a 4.8km/3mi long communal elk hunting system and numerous other stone features. Elevations range between 2,470m/8,100ft and 2,103m/6,900ft. The upper Wind and Wiggins Fork are within the Traditional Homelands of 27 tribes, several of which including Arapaho and Crow also possibly used the Wiggins Fork jumps.

**The Effects of Climate Change on Grand Teton Cultural Resources: A Research Design**

Randall Haas (University of Wyoming), JP Schubert (Grand Teton National Park) and Marcia Peterson (Office of the Wyoming State Archaeologist)

The semi-arid, high-elevation mountain landscape of Grand Teton National Park (GRTE) would seem particularly vulnerable to climate change. Melting ice patches, increasing fire severity, and fluctuating water tables threaten cultural resources. Yet, the extent of such impacts remains unclear. The 2022 U.S. Inflation Reduction Act recently awarded funds to GRTE to assess the effects of climate change on cultural resources. The GRTE archaeology program has therefore teamed up with the University of Wyoming Department of Anthropology to assess these dynamics. This talk summarizes our research design to be implemented over the next four years. The project will focus on the Park's Indigenous heritage resources, which we identify as particularly vulnerable due to their antiquity and historical under-representation in resource management efforts. At the outset, we consider ice patch artifacts, inundated lake sites, perishable architecture, and stone-circle habitation sites to be the highest priorities for evaluation. Phase I of our effort will include Tribal engagement, site-location modelling, qualitative field assessments, and laboratory analysis of previously collected artifacts including geochemical and biomolecular characterizations. These tribal-engagement and meta-analytical research efforts will be used to refine our priorities, establish protocols for respectful research, solicit partnerships, and establish methods to evaluate current anthropological questions. Phase II provisionally entails pedestrian survey and systematic site assessments that may include high-resolution mapping and 3D modelling, photographic documentation, geoarchaeological characterization, sub-surface testing, and additional laboratory analysis. The project will clarify the effects of climate change on GRTE heritage resources, evaluate their cultural significance, and establish protocols for strategic mitigation of climatic impacts.

**Five Feet High and Rising: Impacts to Archeological Resources from the 2022 Historic Flood at Yellowstone National Park**
Beth Horton (Yellowstone National Park)

On the morning of June 13, 2022, a 500-year flood caused extensive resource and infrastructure damage in Yellowstone National Park (YELL) and adjacent lands in the Greater Yellowstone Area. An atmospheric river river caused 5 inches of rain to fall on a late season snowpack in northern portions of the park, impacting over 4,800 acres. This paper discusses the park's initial response efforts, currently known impacts to and losses of archaeological sites and other cultural resources from the floodwaters, and strategies the park is implementing to prepare for the future. Historic ranges of variability are not reliable references for response and planning because climate warming is affecting temperatures, precipitation and snowpack trends and changing the frequency, severity, and timing of droughts, snow melt, intense storms, flooding, and fires. Understanding and anticipating how climate-driven events are likely to interact with landscape features and processes and identifying high priority, vulnerable archaeological resources will help the park navigate a future that is likely to be very different from what was normal historically.

**It's a Numbers Game: Summary Statistics of Archaeological Sites and Surveys in Wyoming**
Connor C. Johnen (Wyoming Cultural Records Office)

Wyoming has been occupied ever since humans first made it to North America and this occupation has left the landscape scattered with materials. These materials have been discovered, documented, excavated, cataloged, curated and analyzed by avocational, professional archaeologists and non-archaeologists. The State Historic Preservation Office Cultural Records Office has been documenting and storing information about all the archaeological materials in the state that have been discovered. This paper will present summary statistics about the archaeological record of Wyoming in the broadest of terms and discuss the potential uses of the curated archaeological dataset available at the Wyoming Cultural Records Office (WYCRO).

**Lithic Landscapes: Management and Study of Ubiquitous Surface Lithic Material**

Connor C. Johnen and Damian R. Kirkwood (Wyoming Cultural Records Office)

The state of Wyoming is blessed with various geological formations that were utilized by peoples in the past. The stone from these formations occur in both primary and secondary deposits that can be widespread across the landscape. These areas have left large archaeological footprints in many portions of Wyoming. There is evidence of quarrying, stone tool manufacturing and maintenance, as well as an abundance of unutilized nodules of raw material. Archaeologists have commonly referred to these large areas that contain primary and secondary deposits as "lithic landscapes". This paper will detail the recorded lithic landscapes of Wyoming. We will then talk about how people have researched and studied these areas. We will then finish off by giving examples of how people have managed these resources in a Cultural Resource Management (CRM) Context.

**Material and Spatial Practices of Labor, Identity, and Heritage at Carbon, Wyoming**

Alexandra Kelly and Jason Toohey (University of Wyoming)

Carbon was one of the first coal mining towns established along the UPRR in 1868, in what was then Wyoming Territory. A company town from the start, Carbon offers an intriguing alternative to popular narratives of Western expansion. This paper will report on two seasons of preliminary research at the site, highlighting the formation and direction of future research questions. We are interested in how the railroad and coal mining industries shaped spatial and material practices at Carbon and aim to explore global commodity circulation, ethnic and class identity, labor politics, and modern-day heritage concerns. Research themes include commodity consumption (both licit and illicit), the development of ethnic and class-based neighborhoods and satellite mining communities, labor strikes and migrant labor, and burial practices. As a contemporary ghost town, Carbon ironically continues to anchor frontier communities of the American West through shared heritage practices and our research benefits greatly from community engagement with local stakeholders.

**Fishy Things: Chinese Trade Networks and Connections Across the American West**
Ryan Kennedy (Indiana University)

Nineteenth-century Chinese diaspora archaeological sites in the American West, including those associated with the Transcontinental Railroad, frequently yield large numbers of fish bones from fisheries around the world. These fish remains serve as evidence of both the localization of Chinese food practices in communities spanning small railroad work camps to large, urban Chinatowns, as well as the extent of Chinese-run trade networks that moved ingredients like dried fish across the Pacific World. In this paper, I explore these themes using fish data collected from several Chinese diaspora archaeological sites, including a late-nineteenth century Transcontinental Railroad repair and maintenance camp occupied by Chinese railroad workers in southwestern Wyoming known as the Aspen Section Camp. Ultimately, fish data provide a window into the lives of Chinese railroad workers, simultaneously highlighting the importance of quintessential southern Chinese ingredients in camp foodways as well as the local, regional, and transnational connections supported by the fish trade and railroad transport.

**Paleoindian Projectile Points from Wyoming**
David Kolkema (University of Wyoming)

Projectile points from the Paleoindian cultural period in Wyoming have long been studied and are iconic to Wyoming's past. To examine these artifacts in mass, a spatial database comprised of 2541 projectile points distributed across 1087 localities across Wyoming was created in conjunction with The Office of the Wyoming State Archaeologist, The University of Wyoming Archaeological Repository, and the Wyoming State Historic Preservation Office. To examine the distribution, statistics, spatial analytics and Geographic Information Systems are used to test two Hypotheses; The distribution of known Paleoindian points across the state of Wyoming is dependent on archaeological survey coverage, and through the Paleoindian period, the number of projectile points at higher elevations increased.

**Structure and Formation Processes of Open-Air Lithic Scatters**

Kenneth L. Kvamme (University of Arkansas)

The structure of open-air lithic scatters has been likened to a "fried egg," with more material located centrally and density falling-off with distance. Much more structure exists, however, owing to several formation processes associated with common activities. A mapping of surface lithic debris and stone tools in a remote and archaeologically rich six hectare region of western Colorado yields a better understanding of spatial structure inherent to such sites. This mapping includes nearly 1,200 formal tools, 200 cores, and 24,000 pieces of flaking debris (> 5 mm) within 6-18 concentrations or clusters (depending on cluster definition). From cluster-to-cluster remarkably consistent patterns of debitage dispersal are apparent. With smaller flakes generally located centrally, as size increases flakes tend to be more widely dispersed. This phenomenon forces other patterns: cortex-bearing flakes, which correlate with larger sizes, are more widely spread as is debitage of coarser-grained material. The pervasiveness of these patterns is replicated by experimental knapping where larger, cortex-bearing, and coarse-grained flakes exhibit wider and highly regular dispersal patterns. Other artifact classes offer insights. Spent cores tend to be located peripheral to dense scatter centers, perhaps reflecting the "toss zones" observed among the Nunamiut by Binford (1978). Grinding slabs, used for processing seeds, nuts, and other materials, tend to be located on mild slopes, offering grinding advantages seen in metate use among Puebloan peoples in the Southwest. Finally, certain activity classes appear spatially segregated, with flaking (dense debitage), grinding (ground stone), and hide preparation (unifacial scrapers) in spatially distinct localities.

**One Cell at a Time: Uncovering the Many Visitors to the Forest Canyon Pass Site (5LR2), Colorado**

Jason M. LaBelle, Aleah G. Kuhr and Kelton A. Meyer (Colorado State University)

Survey crews from CSU's Center for Mountain and Plains Archaeology have examined the alpine ecosystem of the Colorado Front Range over the past ten years, recording a variety of sites such as game drives, lithic and ceramic scatters, and ice patches. We take a "low and slow" survey approach – often finding more artifacts with such intensive methods, but also examining how these sites came to be used and re-used, buried, and exposed over past millennia. Taking this non-site approach, we better view these as cumulative landscapes registering the ebb and flow of human occupation, with some locales showing near continuous use for millennia and others, short term and perhaps one time use. In this presentation, we focus on our on-going work along the Forest Canyon Pass (5LR2) ridge in Rocky Mountain National Park. It is one of the densest lithic scatters known from the Park, with occupations spanning the Late Paleo through historic eras. It has a complex history of occupation, reoccupation, and cultural removal, and as such this palimpsest can be interpreted from a variety of archaeological perspectives.

**Reevaluating Clovis Diets: Microfauna Analysis at the La Prele Mammoth Site (48CO1401)**

McKenna L. Litynski (University of Wyoming)

Researchers have traditionally associated Clovis tradition technology with a specialization of large game, but ongoing debates concerns the significance of a variety of prey, including microfauna, in Clovis diets. This research advances current understandings of the Clovis tradition through analyzing the microfauna collections at the La Prele Mammoth Site (48CO1401). The combination of traditional zooarchaeological techniques and Zooarchaeology by Mass Spectrometry (ZooMS) provided the opportunity to analyze taxa, skeletal element representation, burning distributions, and spatial density analyses based on distances away from hearth features. Results imply that the microfauna bone that exists at La Prele reflects a natural rather than cultural signature.

Keywords: Microfauna, Clovis, Zooarchaeology, Subsistence, La Prele Mammoth Site.

**Eocene Chert of the Wyoming Basin: A Case Study from the Great Divide Paleoindian Surveys**

Chase M. Mahan (University of Wyoming) and Spencer R. Pelton (Office of the Wyoming State Archaeologist)

Presented here is a survey of Eocene chert found within the Wyoming Basin of the Inter-Mountain West. This study improves our understanding of Paleoindian lifeways in a poorly understood region, especially during the Late-Pleistocene. A comprehensive compilation of Eocene geology and knappable toolstone demonstrates the reliance on abundant raw material from the Greater Green River Basin, the prevalence of Eocene cherts in sites throughout the Inter-Mountain West, and a Late-Pleistocene mobility pattern similar to that in other regions of the United States. This review provides much needed lithic source data, Paleoindian mobility interpretations, and geological context for the Wyoming Basin. It uses the Great Divide Paleoindian Survey as a case study, existing archaeological site data and their raw materials to characterize the toolstone environment of a vast landscape used through the Holocene. Additionally, this study provides further evidence for a disparately documented Younger Dryas-aged presence in the Great Divide Basin.

**Terrace, Utah: Population 0**

Christopher W. Merritt (Utah State Historic Preservation Office) and Michael Sheehan (Salt Lake Field Office, Bureau of Land Management)

In 2020 and 2021, staff with the Utah State Historic Preservation Office and Bureau of Land Management conducted excavations in the ghost town of Terrace, located in northwestern Utah. Key to this project was a deep collaborative effort between the archaeologists and the Chinese descendant community, organized through the Chinese Railroad Workers Descendants Association. By the end of the second field session we had fully excavated one Chinese home from the 1870s-1890s, and the excavation yielded significant amounts of information on various topics that bring to better focus the Chinese experience in Utah and on the railroad.

**Making Sense of Time and Space in a 'Noisy' Surface Scatter at the Reddin Site, San Luis Valley, Colorado**
Kelton A. Meyer (Colorado State University)

The Reddin site (5SH77) is an 83-acre open lithic scatter found in the alkali flats of the Closed Basin – an environment scarred with Pleistocene stream channels, wetlands, and playas. The site is best known for its uniquely wide spatial breadth and abundance of Folsom artifacts, 500 diagnostic pieces (projectile points, preforms, and channel flakes). Little is reported about the Holocene archaeology of the site, but it includes nearly 200 projectile points spanning the Archaic and Formative stages – including the Oshara sequence of northern New Mexico. This presentation characterizes spatial and technological relationships between Folsom and later components at the site, and further navigates the maze of analysis when dealing with complex surface scatters like Reddin

**Fort Antonio: Investigations at an 1830s Apsáalooke Trading Post on the Powder River, Wyoming**
Cody Newton (SWCA Environmental Consultants, Inc.)

Fort Antonio, now commonly known as the Portuguese Houses, was a stockaded trading post built under the direction of Antonio Montero in 1834 to trade with the Apsáalooke. Montero operated the post intermittently until 1839–40. Beginning in the spring of 2023, a local rancher and historian initiated measures for a metal detector survey of the post location in anticipation of disturbance due to the installation of a new pivot irrigation system. A grid was laid out for systematic metal detecting of the site and its periphery. The resultant metal detector survey resulted in the recovery of over 500 artifacts. Fortunately, the irrigation system only resulted in disturbance to a small portion of the site, and the landowner has proved amenable to on-going archaeological work at the post. An assessment and discussion of the metal detected artifacts and others recovered from the surface and a test excavation are presented here.

**Folsom Obsidian Conveyance at the Great Divide Paleoindian Sites, Wyoming**

Spencer R. Pelton (Office of The Wyoming State Archaeologist), Chase M. Mahan (University of Wyoming) and Bill Scoggin

We present a study of obsidian artifacts found in Folsom contexts from the Great Divide Paleoindian sites (Great Divide Basin, WY) to evaluate Paleoindian mobility patterns in the central and southern Rocky Mountains. Obsidian sourcing using pXRF demonstrates conveyance from Obsidian Cliff (400 km), Teton Pass (300km), and the Green River/Engineer Quarry source. Other chipped stone raw materials from Folsom localities derive from sources in the upper Green River Basin, thus partially establishing a Folsom mobility pattern between the Yellowstone Plateau, upper Green River Basin, and Great Divide Basin of Wyoming. This study supports the notion that Paleoindians regularly transported lithic raw materials great distances even in relatively raw material rich regions like the interior of the Rocky Mountains and is further evidence for a sparsely documented Younger Dryas-aged use of the Yellowstone Plateau.

**Can Human Presence at Proboscidean Sites be Shown Through Site Taphonomy and Spatial Artifact Distribution? Case Study of Applied Methods on the Warren Mammoth Site**

Mackenzie DePlata Peterson (University of Wyoming)

Archaeological sites containing proboscidean remains in North America have long been a topic of discussion and great scrutiny among the archaeological community. In a study conducted by Gary Haynes and Dennis Stanford in 1984, requirements for early Paleoindian archaeological sites were outlined. These three requirements created clear standards to prove human presence: 1) geochronological coexistence between humans and megafauna, 2) clear association between human and megafauna remains, and 3) clear evidence of human involvement with megafauna remains. Within the archaeological community, highly contested sites often fall short of one or two of these requirements, making human presence difficult to interpret. To aid in current research and discussion of human presence at proboscidean sites, I created two new methods within the computer program R. These are 1) taphonomic comparisons between well-known proboscidean sites both cultural and noncultural and 2) simulated artifact dispersal. Both methods were also applied to further analyze a new site known as the Warren Mammoth Site. This site will provide further understanding of whether bonebed taphonomy and spatial distribution of nondiagnostic artifacts can be another line of evidence in determining human presence at Paleoindian sites.

**Results of the Medicine Bow National Forest Post-Mullen Fire Survey**
Marcia Peterson (Office of the Wyoming State Archaeologist)

On October 26, 2021, and between June 20 and October 21, 2022, with funding from the Wyoming Cultural Trust Fund, OWSA inventoried 950 acres (385 ha) of National Forest land to determine the effects of the 2020 Mullen fire on both known and unknown pre-contact cultural resources. Building on work the Greybull River Sustainable Landscape Ecology (GRSLE) project has undertaken on several burns in the Shoshone National Forest our project has the potential for more widespread relevance to National Forest heritage staff throughout the West who are interested in the impacts of wildfire on cultural resources. Our survey found that while we did not greatly increase the number of new sites found in the Medicine Bow National Forest, the Mullen fire exposed additional elements of many previously recorded sites and supports the need for a quick cultural resource response when wildfires occur. Our results also support the need for consistent survey and recording methods within and between mountain ranges to facilitate meaningful comparisons of archaeological data without the biases that varying recording and survey strategies interject.

**Chinese Railroad Worker Interments and Cemeteries in Utah**

Michael R. Polk (Aspen Ridge Consultants, L.L.C.)

Construction of the Central Pacific Railroad portion of the Transcontinental Railroad largely depended on the labor of young overseas Chinese men. These workers were hired and transported from districts of Guangdong Province in southern China almost directly to the mountains and deserts of California, Nevada and Utah within a few months of leaving China. Railroad construction predated widespread use of mechanical excavation machinery, requiring the Central Pacific to depend largely on the manual labor of these men. Often working in extreme conditions, from the High Sierras to the deserts of Nevada and Utah, large numbers of Chinese workers died during construction between 1865 and 1869 in addition to maintenance personnel who died in subsequent decades along the same route. During construction and in the first years of operation, there were few formal cemeteries in which to bury the fallen workers, especially for Chinese people. The alternative, especially during construction, but even into the maintenance period, was to bury them along the railroad grade, almost certainly following traditional Chinese burial customs. In this paper, the author discusses more than 40-50 grave locations recently identified at or near Terrace, Matlin and Rozel, all section stations on the Promontory railroad grade in western Utah. Also discussed are a few possible nascent Chinese cemeteries which may have evolved from groupings of construction period burials.

**Three Thousand Years of Pine Nut Camps in the Modena/Panaca Obsidian Source Area in Southwestern, Utah**

Heidi Roberts (HRA Archaeology), Keith Hardin (HRA Archaeology), William Eckerle (Cannon Heritage Consultants) and Andrea Brunelle (University of Utah)

Since 2016, HRA Inc., Conservation Archaeology has excavated a dozen Indigenous pine nut camps north of Modena, Utah in the Paradise and Mahogany Mountains. Dating methods, including radiocarbon dates obtained from the sites' hearths and brush shelters, OSL dates on pottery, and obsidian hydration dates on projectile points indicate the area was important for pine nut gathering, hunting, and obsidian procurement since the Late Archaic period. The excavated camps typically included one habitation, such as a shallow pithouse (Late Archaic) or brush shelter (Fremont), associated with extramural hearths and roasting pits. Eckerle's geoarchaeological assessment provided insight into the effects of a 1980s chaining project on the area's fragile pine nut camps. Brunelle's pollen, magnetic susceptibility, and charcoal analyses on soil cores obtained from an adjacent wet meadow suggest that Fremont groups modified the meadow until a large forest fire halted use of the area between AD 1250 and 1400.

**Where is the Bone? The Use of Phosphorus to Determine Evidence of Bone on a Possible High Elevation Bison Jump in the Wind River Mountains, Wyoming**

Morgan W. Robins (Rock Springs Field Office, Bureau of Land Management)

The Dinwoody Bison Jump Site (48FR7682) is located at 11,000 ft. / 3,350 m in Wyoming's Wind River Mountains at the southeast end of the Greater Yellowstone Ecosystem (GYE). This site contains distinct traits that archaeologists use to identify locations of bison jumps. At the Dinwoody Bison Jump Site there is not a bone bed, which is traditionally relied upon as observable, direct evidence confirming the location for a bison jump. This presentation will examine the 2021 results of soil phosphorus analyses used to identify locations of bone decomposition on this site. Sediment samples collected within and outside the postulated butchering area may or may not provide evidence of mass kill episodes at the Dinwoody Bison Jump Site. Bone decomposition can be detected through soil phosphorus analysis, and thus may be a method to detect the presence of a previously – but not currently - existing bone bed.

**An Update on the Conjoined Artifacts from the La Prele Mammoth Site (48CO1401), Wyoming**

by Paul H. Sanders and Todd A. Surovell (University of Wyoming)

The recovery of large-sized lithic artifacts from the 2021 and 2022 excavations at the La Prele Mammoth site (48CO1401), near Douglas, Wyoming, afforded the opportunity to investigate the possibility that a number of them could be conjoined or refit back together again. Some additional artifacts have been conjoined which has now resulted in a total 190 artifacts, representing 86 conjoins. At this time no artifacts were able to be refitted. Discussions will focus on lithic reduction patterns, use of site space, and activity areas. The horizontal distances between these conjoined artifacts and differences in their vertical proveniences provide an additional basis for establishing site integrity.

**Bison Tale: The Western Colorado Bison Project. Evidence of Prehistoric Bison Hunting Specific to Western Colorado**

H. "Sonny" Shelton (Dominquez Archaeological Research Group)

Recent archaeological investigations by Dominquez Archaeological Research Group (DARG) of Grand Junction, CO, are evolving into a fascinating picture of the complex relationship of bison and the prehistoric to early historic hunters of western Colorado. Evidence of the occurrence of bison in western Colorado, previously limited to a few scattered locations, was often represented by a single bone fragment. These specimens were seldom thoroughly examined previous to curation. The Western Colorado Bison Project is the first in-depth archaeological work of its kind to focus specifically on bison procurement and culturally modified bison bone in western Colorado. Thanks to multi-year History Colorado State Historical Fund grant support, extensive research of western Colorado museum collections, along with the evaluation of recent and past archaeological work, has been possible. The resultant data, and new data collected by additional researchers, is submitted to and made available in an interactive, query-style database developed by DARG. To date the project has analyzed and collected data from over 700 bison bone specimens. Cultural modification is evident on a significant number of these faunal elements. Radiometric data and other information collected and analyzed during the project has greatly expanded our understanding of the importance of bison to the early inhabitants of western Colorado.

**Factors Governing the Use of Exterior Space in Montane Campsites of Dukha Reindeer Herders**

Todd A. Surovell (University of Wyoming)

Based on five seasons of ethnoarchaeological research in the Sayan Mountains of northern Mongolia, I will not only discuss the spatial structure of campsites of Dukha reindeer herders, but also the general factors governing how people use the exterior portions of those camps. I focus on a few simple questions: 1) What proportion of exterior camp space is used? 2) Within camps, which spaces are used, which are not used, and why? 3) What is the relative role of natural and cultural features in structuring how people use space? 4) What is the internal spatial structure of the use of activity areas within campsites? Finally, I will discuss the significance of these findings for understanding intrasite spatial patterning in archaeological contexts.

**A Preliminary Characterization of Osseous Foreshafts from Yukon Ice Patches.**

Christian Thomas and Holly Smith (Yukon Government)

After 25 years of monitoring and collection work at ice patches in the southern Yukon, a large collection of well-preserved hunting weapons have been recovered. The value of this collection is that it has revealed a surprising variety of design types for a relatively focused and consistent subsistence activity over the past 9,000 years. In this talk we will present on the design characteristics of 9,000 to 1,000 year old antler hunting dart foreshafts so that these items can be discussed in the context of both earlier ice age osseous technologies and descendent arrow technologies from the interior northwest.

**Anticipating the Unpredictable: Post-Fire Archaeological Documentation and Next-Fire Planning**
Lawrence Todd (GRSLE)

The 21st Century has witnessed an unprecedented rise in frequency, intensity, and geographical spread of forest fires in the Rocky Mountains. Particularly in Wilderness areas, where systematic archaeological surveys are rare, these fires pose severe challenges, erasing vital parts of the regional archaeological record and destroying irreplaceable organic features such as wooden drive lines and timber lodges. In addition, the fires uncover large, intricate archaeological clusters previously hidden by vegetation, offering a unique chance to enhance our understanding. However, this exposure also elevates risks to such previously unknown materials, including increased artifact theft and exposure damage. Using examples of post-fire mountain landscapes, this presentation highlight's the urgent need to develop proactive strategies for managing the unpredictable nature of future fires, thereby fostering a comprehensive dialogue on adaptive management and preparedness.

**Transconceptual Archaeology in NW Wyoming: Working Toward An Integrated Research Program**
Lawrence Todd (GRSLE)

Surface finds. Sites. Excavated artifacts. Regional records. Scale. Landscapes. Collections analysis. Fieldwork. Methods. Methodology. Context. These are words that we as archaeologists often use. They may be included in our sentences but it's rare for the full assemblage of concepts to be integrated into our research programs. This presentation emphasizes the importance of this type of integration and provides examples largely from NW Wyoming's Shoshone National Forest. Using a variety of multi-scalar observationally based investigations, a range of spatial and temporal patterns from multiple data sets are described. This transconceptual perspective can provide interpretive potentials that vastly exceeds what we can learn from focusing on single archaeological topics/concepts.

**2019 Archaeological Testing of the 1879 Waterwheel and Associated Ditch at Fort Laramie National Historic Site, Wyoming**

Danny N. Walker (University of Wyoming) and Sylvia Huber (Sylvia Pro.D Consult)

Post gardens were common during the military occupation at Fort Laramie National Historic Site, and depending on the year, scattered across the landscape. Water sources were dependent on the garden location in the fort grounds. At least two military age irrigation systems have been recorded at Fort Laramie. One involved use of a waterwheel with a stone base placed in the Laramie River. Archeological excavations at this area in 2019 resulted in recording the remains of the headgate area. Most of the waterwheel was destroyed following abandonment of the waterwheel and its associated garden by the army after 1879. Photographs taken between 1996 and 2019 show the remaining rock wall in the Laramie River, apparently one of the two walls supporting the waterwheel itself, had been functionally destroyed by a series of high-water episode, primarily in 2010 and 2011. Excavations between the headgate and the army garden showed water was run from the headgate along a wood flume for the first 30-35 meters and then a simple ditch took the water to the post garden. Despite these destructive acts by the river, significant data were collected helping to identify how the waterwheel, headgate, and water ditch were constructed.

**Indigenous Camp Structure and Territorial Boundaries at the Demijohn Archaeological District of the Pryor Mountains**

Cole Wandler (Barron Cultural Resource Consultants), Samuel Yeates (Barron Cultural Resource Consultants) and Blake Griffin (Wyoming Military Department)

Barron conducted a pedestrian survey of the Demijohn Archaeological District in late 2023. This presentation will provide a preliminary overview of the district's resources and discuss the efficacy of field methods commonly employed by cultural resource managers. Demijohn is a significant but underreported precontact district located at the southern end of the Pryor Mountains in Montana. It includes several hundred stone circles, indigenous trails, large rock art panels, and dozens of hearth features spread across and around a wide plateau with unencumbered views of the Bighorn Basin. Diagnostic artifacts and features suggest intensive use of the area through the Late Archaic and Protohistoric periods. We hypothesize that Demijohn was a vital "rendezvous" point where indigenous groups from the Northwestern Plains (especially eastern Montana) made resource excursions into the Bighorn Basin and western Wyoming. The is evidenced by the presence of diagnostic artifacts and lithic materials associated with eastern Montana and steatite bowl fragments and obsidian likely obtained from western Wyoming. We propose that the district sits at the boundary of traditional indigenous territories and can elucidate precontact trading practices. It also provides an opportunity to examine large-scale camp structure. There are differences in stone circle and hearth placement, design, and density that suggest that discrete temporal occupations can be gleaned based on the surface assemblage alone.

**To Hell Gap and Beyond: Expanding Timeframes and Insights into Paleoindian Artifacts**

Clifford White and Marcel Kornfeld (University of Wyoming)

Researchers recently recovered another bone needle fragment from Locality I of Hell Gap. The needle, recovered from unit 14W200-23, was excavated during the 2023 field season. This needle was discovered in matrix excavated from a lower stratigraphic context than previously recovered Hell Gap needles. The stratigraphic context of the 23 preceding needle fragments suggests they are from the Folsom component. Although more analysis is required, the latest bone needle's stratigraphic position may expand the timeframe of bone needle utilization at Hell Gap's Locality I. Today, a total of 24 bone needle fragments have been recovered from Hell Gap's Locality I equaling the 24 fragments recovered at the Lindenmeier site in Larimer County, Colorado. Bone needle data, when integrated, can aid in understanding the occurrence of material artifacts and in interpreting other archaeological data. This research provides insight on recently discovered bone needles at Paleoindian sites across the western US.

**Hunting the Colorado High Country: Results from the James Peak Wilderness Archaeological Project**

Aaron Whittenburg (Metcalf Archaeological Consultants)

The James Peak Wilderness Archaeological Project was a collaborative project between Gilpin Historical Society and Metcalf Archaeological Consultants and funded by two History Colorado-State Historical Fund archaeological assessment grants. Two projects, the James Peak Wilderness Archaeological Assessment and the James Peak Wilderness Sub-Alpine Basin Archaeological Assessment, explored the precontact use of the alpine and sub-alpine regions surrounding James Peak, and focused on the use of alpine communal hunting sites and their related sites in the adjoining sub-alpine basins. Between Fall 2019 and Spring 2022, Metcalf archaeologists and volunteers conducted survey along the northeast ridge of James Peak and the adjoining sub-alpine cirque basin at the head of Mammoth Gulch and recorded a total of seven new precontact sites, including three communal hunting sites, two lithic scatters, one open camp, and one stone feature. These two projects add to the growing corpus of data available for the alpine and sub-alpine regions of the Colorado Front Range Mountains, which could then serve as baseline data to launch holistic research projects addressing the occupation and use of the alpine and sub-alpine areas as mutually inclusive landscapes in the lifeways of Colorado's original occupants. This project also had a strong emphasis on public involvement, outreach, and education and included volunteer involvement in survey, presentations to the Colorado Council of Professional Archaeologists, Gilpin Historic Society, and the Chipeta Chapter of the Colorado Archaeological Society, and the use of social media platforms to reach a wider and more diverse audience

# Poster Abstracts

**Utilizing Digital Elevation Models to Analyze Use-wear on Folsom Ground Stone**

Lance R. Anderson (Eastern New Mexico University)

Among the myriad of artifacts found at the Hell Gap archaeological site is a collection of under-investigated ground stone tools; an important component of ancient cultures and their toolkits. One such artifact is 14T200-15935 from Locality I at the Hell Gap National Historic Landmark. This study utilizes Agisoft Metashape, a 3D model-building software that generates sub-millimeter accurate models through Close-Range Photogrammetry. Digital Elevation Models (DEMs) can be constructed through this method, allowing us to visualize use-wear on this artifact more accurately; giving us an insight into how it may have been used.

**Pre-contact Stone Paint Palettes from the Bighorn Basin**

Michael T. Bies (O W Heritage Research), Barrie Lynn Bryant (Arapaho Ranch Field Station) and Alexandra Deselms (Meeteetse Museum)

Recently two paint palettes were identified from the Western Bighorn Basin of Wyoming. These palettes are very similar in form and both show traces of red pigment. One was collected in situ by the Northern Arapaho Tribal Historic Preservation Office from beneath a rock art panel. The other was donated to the Meeteetse Museum collection by the estate of a rancher. This poster is presented to inform others of this type of artifact in the region and in hopes that similar artifacts may be in collections but not published or otherwise identified as to their function. Both of the artifacts were recovered in ancestral Shoshone territorial lands; the in situ artifact was located on Wind River Historical Reservation Trust Lands the other was likely collected from Bureau of Land Management administered lands. Representatives of both Tribes were provided with an opportunity to participate in this poster.

**A Tale as Old as Excavation: Bonding at Hell Gap National Historic Landmark**

Dakota R. Buhmann (University of Wyoming)

Archaeological sites hold a special place in the hearts of the archaeologists who work at them. In the far-flung areas of the world, archaeologists create connections with the land and the individuals they work with. Personal experiences, environment, and the ritualistic suffering endured at these sites serve to forge better archaeologists and create a consistent experience in archaeology. Archaeological sites serve as spaces for career defining moments for the individuals who work in them. Hell Gap National Historic Landmark in Wyoming is no exception in fostering these connections. Since excavations began at the site in the 1960's, the excavators who have inhabited its area have not forgotten how it changed them. The oral histories that we have collected, and images of the excavators we interviewed, allow us a window into the past to see how the comradery developed between individuals. Alongside photographs of the present and the autoethnography of the author, we can see how bonding has stayed consistent in the last 60 years.

**Traditional Ecological Knowledge, Indigenous Women, and Traditional Fire Practices in the Far North**

Kassandra Dutro, Casey Black and Briana Doering (University of Wyoming)

Traditional Ecological Knowledge (TEK) is one of the ways that human beings understand and interact with their landscape. With the growing concern of climate change and ecological impacts, it is vital for researchers to explore other forms of knowledge and include Indigenous voices. Using the Alaskan landscape as a case study, I aim to explore the intersections around fire offering a new perspective through Indigenous women and girls of the Dene (Athabascan) speaking communities. My focus is centered around women's/girls' interactions with their environment and specifically fire from both natural and human made sources throughout the recent and more distant past. In order to achieve a more holistic perspective, I will compare data from Indigenous oral histories, Indigenous language dictionaries, material culture from multiple Interior Alaskan archaeological sites, and publications ranging from multiple disciplines.

**FactorEarth™ Record: An All-In-One Digital Form Solution**
Jessica Ericson (Metcalf Archaeological Consultants)

Metcalf Archaeology™ launched FactorEarth™ in 2018 to offer technologies that put our world and heritage within easy reach. One of the applications, FactorEarth™ Record, is an all-in-one electronic form solution that takes projects from start to finish to solve the problem of going from paper to digital. Industries like cultural resource management, natural resource management, and environmental compliance can do more in less time with Record. Visually, the Record app interface looks like the management forms professionals have worked with for years. It allows a user to view data easily while also allowing for real-time collaboration with team members. It's designed for collecting data in the field, sharing and editing in the office, and producing submission-ready form deliverables. These features make Record an amazing training tool for firms and universities alike. We are bringing data collection, collaboration, and efficient form export capabilities together in one app.

**Ritual or Everyday Use: Application of Digital Photogrammetry for Use-Wear Analysis of Hell Gap Ground Stone**
Lauren K. Griego (Eastern New Mexico University)

Analyzing stone tool use-wear is becoming more advanced due to digital methodologies evolving in archaeology. Evaluating wear of ground stone will allow for a comprehensive study into the lives of those who called the Hell Gap valley home about 10,800 years ago. A palette found at the Hell Gap National Historic Landmark is analyzed using photogrammetry to build a 3D model on Metashape. Furthermore, the Digital Elevation Model (DEM) is used to identify wear marks that might not be visible to the naked eye. This model will allow for a digital recording of this artifact, a technique not yet practiced on this palette. The goal is to help archaeologists develop a more extensive view of how Indigenous peoples once incorporated ground stone technology into their everyday lives.

**An Analysis of Organic Materials from an Ice Patch**

Colin King (Montana State University)

Ice patches are a unique source of information that can be used to infer past environments. With support from the Matthew Hansen Endowment for Wilderness Studies, and the Beartooth Environmental Alpine Archaeological Research Group, I was able to participate in two archaeological surveys of ice patches in the Greater Yellowstone Ecosystem in 2023. While both surveys were compromised by late lying snow, one resulted in the identification of non-rooted—and likely non-cultural—wood in association with two ice patches. Examination of Google Earth imagery indicates the presence of two small ice cores; a ca. 15 m long transverse core, as well as a less defined 10 m lateral core of ice in this location. The ice patch was identified by Lee's 2019 revised assessment of snow and ice for the Greater Yellowstone Coordinating Committee (GYCC) as "SB1_A." With additional support from Montana State University's Undergraduate Scholars Program, I was able to submit samples of the three collected specimens to Paleoscapes Archaeobotanical Services Team (PAST) for genus and composition analysis. PAST's analysis suggests that two of the samples (1A and 2A) are consistent with Picea (spruce). The composition of the samples appears to be similar, and macroscopic observations suggest they are likely fragments of branches. The third sample (3A) is a species of Abies (fir), with the generally smaller size of the tracheids suggesting it is from a branch. With the financial support noted above, a fragment of the spruce and fir were submitted for radiocarbon analysis, the result of which will be compared to extant reports on dated wood from other ice patches in the Rocky Mountains.

**Integrating the Hell Gap Ground Stone Assemblage into the Folsom technology at Locality I**

Marcel Kornfeld (University of Wyoming) and Elizabeth M. Lynch (Eastern New Mexico University)

The archaeology at the Hell Gap National Historic Landmark documents North American life on the frontier of the Rocky Mountains from about 13,000 to 8,500 years ago. Our current understanding of camp activities is derived from research on the features, chipped stone artifacts, formal tools and animal remains. Very little research has been conducted on the ground stone tools. General assumptions are that they relate to tool production or ochre processing. Our paper explores the ground stone tools found at Locality I within the context of Folsom production processes. Integrating the ground stone tools provides another way of understanding past behavior, in particular ritual processes in camp-life tool production.

**Examining the Isotopic Signatures of Late Pleistocene and Early Holocene Hearth Features from the Bachner Site (XBD-155) near Quartz Lake, Alaska**

McKenna Litynski, Gideon Buchanan and and Casey Black (University of Wyoming)

The Bachner Site (XBD-155) is a stratified multi-component archaeological site located near Quartz Lake, Alaska near the Tanana River. Evidence of human occupation at this site spans from the Late Pleistocene (~13,000 years ago) through the Late Holocene (~2,000 years ago). Bachner has yielded a variety of stone tool artifacts, bone straws, sewing needles made from bone, and faunal remains across the different occupation surfaces. Additionally, several hearth features have been discovered at the Bachner Site which provides evidence of people cooking animals for subsistence purposes. This project includes stable isotope analyses of δ13C, δ15N, %C, and %N values from sediment samples recovered from two different hearth features, as well as five different sterile stratigraphic levels throughout the site's stratigraphic column. Our goal involved understanding dietary and environmental trends through comparing and contrasting isotopic signatures associated with the stratigraphic levels and hearth features. Results indicate shifts in isotopic signatures through time, with the most surprising result being the decrease of δ15N values with depth. In regards to the hearths, there is a clear difference in subsistence strategies with Hearth 2 yielding higher δ15N values, a characteristic of freshwater fish subsistence. Additionally, Hearth 1 had higher %N, %C, and %S than Hearth 2 which could indicate Hearth 1 was fueled by bone rather than vegetation. This research improves our understanding of the environment and subsistence economies of Bachner and allows archaeologists to interpret flora and fauna records at a higher resolution compared with traditional zooarchaeological and paleobotanical approaches.

**From Greenland to The Rocky Mountains: How Two-Eyed Seeing Informs Identities of Places through Toponyms**

Agnes Macy (Bowdoin College) and Joey Lancia (Central Wyoming College)

In colonial settings, toponyms often extend Western knowledge and power over Indigenous peoples. A Two-Eyed Seeing approach to research integrates Indigenous and Western knowledge systems, presenting a dynamic view of the landscape full of Indigenous place names, cultures, memories, and stories. The integration of Indigenous place names in current research can work towards decolonizing praxis in the discipline. This poster draws on ethnographic fieldwork conducted by Macy in Greenland and Lancia in the Rockies. Our backgrounds working with Inuit and studying Arapaho toponyms have created a framework for researching, documenting, , and sharing place names to benefit Indigenous communities and educate non-Indigenous peoples. We connect how our previous anthropological research can be applied to the Rockies. Macy created an interactive GIS map and StoryMaps of West Greenland—translating Inuit place names—so users can learn about naming practices. Macy also conducted fieldwork in Greenland—sharing historic photographs of communities with current residents of those same places and documenting local stories and place names. Lancia has explored autoethnographic and ethnographic data from northern Colorado and New Zealand. He utilizes Indigenous scholars' works, primary sources, personal experiences, and examines social and political dynamics of toponyms of mountains and their origins in different knowledge systems. He has produced a commentary on the importance of revitalizing Indigenous knowledge through place names. We explain how similar methods can be implemented to share and learn about place names in the Wind Rivers, particularly Wiggins Fork Bison Jumps project, where Macy will work with Guenther this summer.

**Hunting Preferences In Archaic Period Housepits In Central Wyoming Using The Artiodactyl Index**

Fox Nelson (University of Wyoming)

The idea that big game acquisition has a long-standing antiquity among humans and their ancestors is deeply ingrained in our intellectual history (Lupo 2016:185). However, bison, rabbits, rodents, and pronghorn make up the vast majority of NISP counts in archaeological faunal assemblages (Lubinski 2000:176). While this might mean archaeologists would give credit to both artiodactyls, hooved mammals, and lagomorphs, smaller mammals like rabbits, this is not always the case (Cannon and Meltzer 2004:1972). According to Karen Lupo (2016:185-186), this has a lot to do with the idea of the prey choice model, which favors big game specialization since larger prey, such as artiodactyls, offer a higher caloric return than smaller animals and thus will be pursued when encountered. Using the artiodactyl index of 11 middle to late Archaic housepit sites in the Wyoming Basin, I evaluate the hypothesis that Indigenous peoples in Wyoming were big game specialists during the Archaic period. My results based on these 11 housepit sites indicate that while in some contexts big game hunting did occur, diet was much more diverse than previously thought.

**Insight into Holocene Wyoming Bison Population History with Ancient Genomes**

Jonas Oppenheimer (University of California, Santa Cruz), Lawrence C. Todd (GRSLE), Richard E. Green (University of California, Santa Cruz), Gregg P. Adams (University of Saskatchewan), Greg A. Wilson (Parks Canada Agency) and Beth Shapiro (University of California, Santa Cruz)

American bison (Bison bison) underwent a drastic population collapse at the end of the 19th century, with tens of millions reduced to only a few hundred individuals within decades. Though bison have recovered following concerted conservation efforts, this demographic event obscures prior genetic diversity and population structure. Bison genomes that existed before this decline provide an opportunity to directly examine changes in bison population history over time and contextualize current genetic patterns across herds. We sequenced and radiocarbon dated 16 bison petrosal elements from the five sites in Wyoming: Scoggin, Hawken, Finley, Carter Kerr-McGee, and Horner. These sample ages span most of the Holocene, from ~10kya - ~3kya, providing a near-continuous record of Wyoming Holocene bison. DNA preservation was extraordinary across all samples considering both their ages and non-permafrost origin, with an average of 78% of the extracted DNA being endogenous to the sample, rather than originating from environmental contaminants. However, the DNA we recovered had typical characteristics of ancient specimens, including short fragment lengths and elevated rates of cytosine deamination at the ends of molecules. We compared the genetic affinity of these Wyoming bison to each other and to other ancient and modern bison, finding strong connectivity across the Great Plains, with samples grouping not geographically but temporally, with close genetic connections between bison of similar ages at opposite ends of the Great Plains. This suggests that Wyoming bison once had significant gene flow throughout North America, which stands in stark contrast to today's heavily managed bison herds.

**Chasing the Pleistocene at Hell Gap Locality IV**
Spencer R. Pelton (Office of the Wyoming State Archaeologist), Marcia Peterson (Office of the Wyoming State Archaeologist), Scott Wheeler (University of Wyoming) and Carlton Shield Chief Gover (The University of Kansas)

The Hell Gap National Historic Landmark is significant for its association with stratified Paleoindian deposits previously reported from four of five Localities identified along Hell Gap Creek. Locality IV, the site's southernmost, has been the subject of few intensive investigations because it is the sole Locality in which buried Pleistocene and Early Holocene deposits have not been found, containing instead a sequence of Holocene channel fill deposits and a dense near-surface archaeological assemblage dating to the last ca. 5,000 years. That perception changed in 2018, when a fluted preform was found eroding from the Locality IV arroyo bank, suggesting that intact Paleoindian deposits may be present. Here, we summarize our knowledge to date regarding the Locality IV archaeological and geological deposits and present future research directions.

**Revisitng Krmpotich: Folsom Flutes and Manufacturing Idiosyncrasies**
Michael R. Peterson (US Forest Service) and Marcel Kornfeld (University of Wyoming)

The Krmpotich Folsom locality was investigated over 20 years ago and plays a significant role in understanding Folsom occupation of the Rocky Mountains and Folsom chipped stone economy. The site, in the western portion of the Killpecker dune field is in the vicinity of other Paleoindian localities, namely the Finley Cody bison bone bed, which also contains some Folsom material. Other sites in the vicinity exhibit late Paleoindian components such as Deception Creek as well as Late Prehistoric Eden-Farson Shoshone camp and antelope procurement site. A recent reanalysis of Folsom flutes from the Krmpotich site, shows a pattern of flute removal suggesting a limited number of makers at the site. In this presentation we review the nature of the Krmpotich site and discuss the fluting idiosyncrasies, arguing that the data suggests limited number of Folsom makers occupied the site.

**Investigating Human Mobility in the High Alpine through Strontium Isotope Analysis**

Amy Phillips (St. Cloud State University)

Ice patches are retreating due to climate change. In their wake, materials—often rare organic artifacts and irreplaceable palaeoecological data— are exposed and begin to decay. In 2015, bows GL 5-3 and GL 7-3 were recovered from two locations in the Cougar Ice Patch group, 11 ice patches in the Absaroka Mountains of northwest Wyoming. Both bows date to the Late Prehistoric period. Bow GL 7-3, made of spruce (Picea) and recovered at 3431 m, dated to 625 ± 26 uncal BP. Bow GL 5-3, of pine (Pinus) and found at 3405 m, was dated to 160 ± 30 uncal BP. Strontium (Sr) isotope analysis presents an opportunity to determine the provenance of organic materials melting out of ice patches. Sr isotope analysis has been used regionally to assess ungulate migrations and nationally to study human movement through transported objects but never on organic materials from a freshwater ice patch. Freshwater has a low Sr concentration, unlike saltwater, and should not contaminate the wood's original Sr concentration. To test this hypothesis, samples of wood from across an isoscape model based on geologic bedrock, wood from the ice patch, and the ice patch itself will be analyzed to contextualize the bows. This research will test the use of Sr isotope analysis on organic artifacts from freshwater ice patches as an indicator of human mobility.

**New Approaches in Optical Dating of Archaeological Rock Surfaces: The Gunnison Basin Case Study on Lithic Surface Artifacts**

Noah Powell (University of Oklahoma), Michael Meyer (University of Innsbruck), Bonnie Pitblado (University of Oklahoma), Loic Martin (University of Innsbruck) and Christopher Merriman (Adams State University)

In recent years, optically stimulated luminescence (OSL) dating has shown promise to be a useful geochronological tool in dating lithic surface artifacts. When quartz materials are exposed to the sun, they are "bleached," and subsequently, their "clock" is set to zero. After burial, quartz grains begin to accumulate radiation from the surrounding environment. OSL dating measures the amount of radiation stored in the quartz grains and determines when the material was last exposed to sunlight. Surface artifacts such as stone cores are often partially embedded in the soil, allowing for OSL dating of the bottom portion to determine a date range of when that artifact was last used. We collected 50 surface artifacts, 49 buried artifacts, 10 hammerstones, 13 calibration stones, and 3 sediment samples from a well-used quartzite quarry in Gunnison Basin, Colorado. Our goal was to reconstruct these artifacts' burial and bleaching histories and establish OSL rock surface dating as a novel way to ascertain the age of archaeological artifacts. The analysis is still underway, but initial luminescence tests indicate our samples are suitable for OSL rock surface dating.

**Charcoal Identification and Analysis from Sister Hill Paleoindian Site (48JO314)**

Haley Purifoy (University of Wyoming)

The transition from the Pleistocene and the Holocene brought about substantial changes to the climate and as a result to vegetation as temperature and precipitation levels changed. Charcoal collected from archaeological sites can be used in paleoclimate and vegetation reconstruction from this important ecological shift. Changes in climate result in new vegetation patterns that can be reflected in human use of woody plants for hearth fuel. One site that covers that transition is Sister Hill Paleoindian Site south of Buffalo, Wyoming. The site contains a Cody occupation level and a Hell Gap component, and a late Paleoindian occupation spanning 11,000BP to 9,500BP. Charcoal samples were collected from hearth features in each component. Samples were identified using a light microscope to compare features to an established charcoal reference collection. Many of the samples were too small to determine genera specific taxonomic classifications. This information is still important, however, as it provides some information as to shifting vegetation in response to climate changes in the region.

**From Archaeology to Paleontology: Giant Ground Sloth from the Hell Gap Site, Wyoming**

Rachael Lea Shimek (Office of the Wyoming State Archaeologist) and Marcel Kornfeld (University of Wyoming)

The Hell Gap site in southeastern Wyoming is a stratified Paleoindian camp site nestled in a valley at the very edge of the Great Plains/Rocky Mountain ecozone. During the 2023 field season, a molariform tooth of an extinct giant ground sloth was recovered from sediments dating to the Pleistocene/Holocene transition between 11,000 and 13,000 years ago. The tooth represents an individual of advanced age and was not associated with cultural materials. This tooth is the first specimen of giant ground sloth ever found in Wyoming. It bridges the gap between previously-known specimens from both Montana and Colorado, helping push the range of giant sloths out from the eastern plains and forests and into the Rockies. Although there is no indication of interactions between the sloth and the humans who ccupied the Hell Gap site, the serendipitous discovery of the sloth molar in pre-cultural sediments at this archaeological site is a significant contribution to Pleistocene sloth studies.

**Exploring Rock Art Site Location in the Bighorn Basin: A Spatial Analysis of Social Conductance and Least-Cost Modeling**

Ann-Marie Stephens (Wyoming Cultural Records Office, University of Wyoming)

This project investigates the spatial distribution of rock art sites in the Bighorn Basin via social conductance modeling, which emphasizes the sociocultural conditions that pull people toward places and compares it with least-cost modeling, which implements practical conditions that push people toward optimal places. This study builds upon the work of Field et al. 2020 which interrogates cost optimization modeling as an effective tool for mapping archaeological site placement. This study focuses on Dinwoody tradition rock art, located in the southern extent of the basin near the Owl Creek and Bighorn Mountains. High degrees of motif style aggregation are hypothesized to reflect resource abundance and possibly indicate specific cultural, spiritual, or territorial purposes for rock art creation. The project assumes the intentional placement of rock art sites for social signaling, prompting an investigation into the balance between cost-based and conductance-based movement patterns between rock art sites.

**Testing the use of lichen cover on rock lines associated with a prehistoric hunting site (bison jump) in NW Wyoming to date their construction**

Cadence Truchot (Utah State University), Emma Krolczyk (Utah State University), Tammy Rittenour (Utah State University) and Todd Guenther (Central Wyoming College)

This research investigates the use of lichenometry to provide age control for archeological features. The Wiggins Fork Bison Jump Complex, a prehistoric aboriginal hunting site in NW Wyoming, was used repeatedly to run buffalo off escarpments and steep slopes to supply tribes with enough food to last the winter. My research investigates the use of lichen cover on piles of placed rocks to date cairn lines associated with the jump, as well as the jump funnel at the mouth of the jump that routed the bison off the escarpment. Cairns are piles of ~2 to 15 rocks that would keep the buffalo in a designated area during this communal hunt process. It is expected that older rock constructions will have greater lichen cover. This can be tested by comparing the percent cover of the rocks by lichen to Optically Stimulated Luminescence (OSL) dates collected from under the same rock cairns as part of MS thesis research by E. Krolczyk at Utah State University. OSL provides an age for the last time sediment was exposed to light and should provide a date for when the rock was set on the land surface. My research approach of using lichen growth to provide relative cairn construction ages is faster, less costly, and less disruptive of the delicate archaeological features than the use of OSL dating, which requires lifting of rocks to date the sediment underneath. In general, lichenometry from photographs will cause less destruction of archaeological sites, which are viewed as living features and sacred to tribes. The results of this research will provide guidance on the use of lichen-cover to date archaeological rock features at the Wiggins Fork Bison Jump Complex and similar sites throughout the region.

**Expanding our Understanding: Insights From the Hell Gap 2023 Field Season**

Clifford White (University of Wyoming), Brianna Houghton (University of Wyoming), Dakota Buhmann (University of Wyoming), Joel T. Collie(University of Bahamas), Rachael L. Shimek (Office of the Wyoming State Archaeologist), Lucille Holt (University of Wyoming), Camden Shakespeare (University of Bahamas) and Marcel Kornfeld (University of Wyoming)

The Hell Gap site (48G0305) is a stratified Paleoindian campsite encompassing all the cultural complexes found on the Great Plains from 11,000 to 8,000 BP. Over a span of more than 20 years, this ongoing project has generated abundant data and artifacts, offering researchers a rich opportunity to explore North American pre-history. In the recent 2023 field season, excavations focused on substrata E2, E1, and D stratum, aiming to uncover pre-cultural strata in the east block units of Locality I. While artifacts were scarce in the cultural layers of Locality I, a notable discovery was made: a Giant Sloth tooth. Additionally, a successful surface survey near the "Well Section" of Locality IV complemented the excavation efforts at Locality I, showcasing the diverse artifacts unearthed at Hell Gap. This research highlights the artifacts recovered at Hell Gap in 2023.