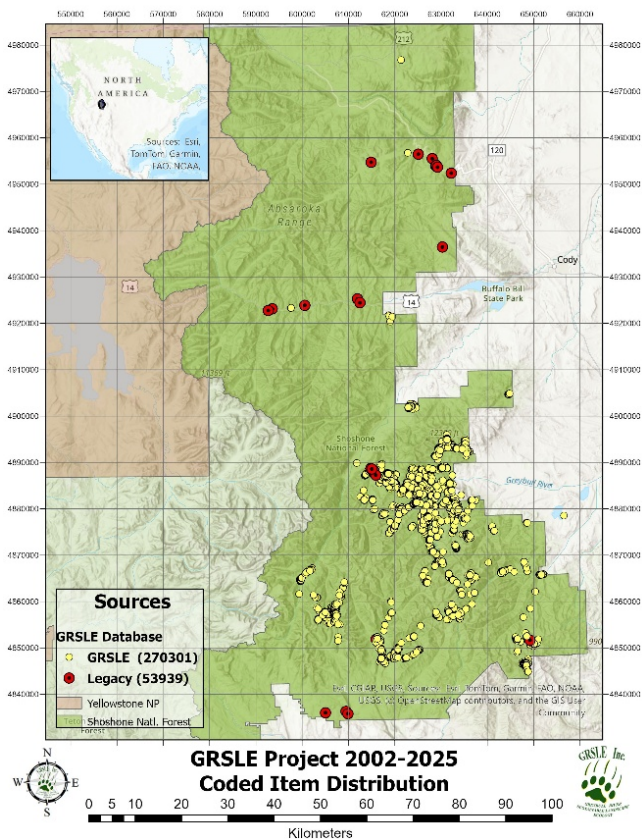




Welcome to our posters!



Over fifty years ago, when I first attended the Plains Anthropological Conference, the maps of the Absaroka high country were nearly blank in terms of archaeology. Today, thanks to more than two decades of sustained effort through the Greybull River Sustainable Landscape Ecology (GRSLE) Project, those same maps are filled with hundreds of thousands of carefully documented artifacts, ecological traces, and site records. What was once a wilderness “without a past” has become one of the best-documented mountain regions in North America.

This symposium brings together both seasoned researchers and the newest generation of students to showcase what we call our “little big data” approach: context-rich, cumulative, and comparable datasets that challenge old boundaries between sites, isolates, classes, and even centuries. From glass beads to cartridge casings, fences to isotope samples, microfauna to elk migration paths, these presentations highlight how rethinking the unit of analysis—and filling in the so-called blank spots on the map—can transform how we understand the Northern Plains and Rocky Mountains.

Thanks for taking the time to look at and chat about our posters.

Larry Todd 

SYMPOSIUM ABSTRACT

GRSLE Archaeology 2025: Expanding Contextual Archaeology from Wilderness to Foothills in the Greater Yellowstone Ecosystem, NW Wyoming

When the Greybull River Sustainable Landscape Ecology (GRSLE) Project began systematic fieldwork in the Absaroka Mountains in 2002, the Washakie Wilderness had only a single prehistoric site recorded. Over two decades later, through consistent, cumulative artifact-based documentation of more than 5000 hectares and over a quarter million data points, we have demonstrated that high-elevation landscapes were neither empty nor marginal, but central to long-term human use. This “little big data” approach—slowly built, context-rich, and systematically recorded—has created one of the most comprehensive regional datasets in the Greater Yellowstone Ecosystem if not in the entire Plains. Yet, our results also highlight a paradox: the mountains are no longer “blank” but instead densely populated on the archaeological map, while the surrounding lower elevations remain analytically underdeveloped. Methodological differences between artifact-based documentation and other more common site-based treatment of surface archaeology do not allow meaningful comparison. In 2025, GRSLE initiated new survey and inventory projects extending into these “analytical blank spots,” applying our established methods to create directly comparable datasets. This symposium presents initial findings from 2025, exploring how filling in blank spots reshapes our understanding of regional land use, mobility, and long-term human ecologies.

POSTER ABSTRACTS

GRSLE 2025: Student Research across Alpine and Basin Landscapes

Authors: L. Todd, D. Dalmas

The 2025 GRSLE field season brought together a diverse group of student researchers who each pursued distinct projects within a shared framework of systematic artifact-based inventory designed to better understand landscape scale archaeological patterning. While working across alpine ridges, montane valleys, and basin foothills, students developed focused studies on a variety of topics. By combining these individual projects within a long-term cumulative



survey effort, the 2025 season provided both comparative data and hands-on research opportunities. This poster highlights the breadth of student-led investigations, showing how diverse topics and approaches contribute to a larger picture of human use of the Greater Yellowstone Ecosystem by prompting question-driven fieldwork.



Alpine and Sage Grasslands – GRSLE Mountain and High Plains Archaeology 2025

Authors: L. Todd, D. Dalmas

The 2025 field season of the GRSLE project expanded our long-term research program beyond high-elevation wilderness settings into lower elevation landscapes of the Big Horn Basin. This poster compares two systematically recorded, artifact-based inventory blocks located along a single drainage system—one at ~3100 m in alpine grasslands and another at ~2600 m in sage-steppe foothills. Both areas were surveyed using 5 m transects, single recording protocols, and individual stored GPS tracklog data to ensure direct comparability. Field documentation and preliminary results are presented, highlighting how consistent artifact-based (rather than site-based) inventory methods can bridge analytical gaps



between montane and basin settings. A primary goal of this multi-setting approach is to evaluate archaeological evidence for differing human uses of sharply contrasting landscapes, and to explore how filling in “blank spots on the map” may reshape our understanding of mobility and land use in the Greater Yellowstone Ecosystem.



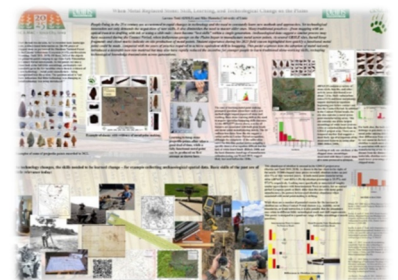
When Metal Replaced Stone: Skill, Learning, and Technological Change on the Plains Authors: L. Todd, R. Hamada

Authors: L. Todd, R. Hamada

People living in the 21st century are accustomed to rapid changes in technology and the need to constantly learn new methods and approaches. Yet technological innovation not only demands the acquisition of new skills, it also diminishes the need to master older ones. Many traditional practices—from mapping with an optical transit to drafting with ink or using a slide rule—have become “lost skills” within a single generation. Archaeological data suggest a similar process may have occurred during the Contact Period, when Indigenous groups on the Plains began to manufacture metal arrow points. At several GRSLE sites, barrel hoop fragments and chisel marks indicate on-site production of metal points. Student experience during the 2025 field season highlighted



how quickly a functional metal point could be made, compared with the years of practice required to achieve equivalent skill in knapping. This poster explores how the adoption of metal not only introduced a desirable new raw material but may also have rapidly reduced the incentive for younger people to learn traditional stone-working skills, reshaping technological knowledge transmission across generations.



From Segregated to Integrated: Rethinking Big Data with GRSLE

Authors: C. Orngard, L. Todd, D. Dalmas, D. Rapson

Archaeology increasingly engages with “big data,” yet most datasets remain fragmented—site-based, artifact-class specific, or built from incompatible systems. The GRSLE Project offers an alternative: a “little big data” approach developed through continuous high-elevation fieldwork in northwest Wyoming since 2002. Rather than segregated artifact classes, GRSLE employs a unified coding system that records every object—lithics, faunal remains, features, historic materials, and modern traces—at the individual level. Over 250,000 artifacts have been cataloged, producing scale without losing context and enabling interpretations that move beyond



traditional site boundaries. The system balances detail with accessibility: refined enough to capture variability yet simple enough for new students to apply consistently. This poster introduces GRSLE’s integrated big data framework and evaluates its broader utility. We argue that cumulative, context-rich datasets open avenues of research not possible in fragmented ones—and that integration, not aggregation, is what makes Big Data transformative for archaeology.

Spent but Not Forgotten: Cartridges in the GRSLE Dataset

Authors: C. Orngard, L. Todd, D. Dalmas

The GRSLE Project records all traces of human activity in the alpine landscapes of northwest Wyoming, from lithics and faunal remains to modern recreational features. Among these datasets are hundreds of cartridge casings, each documented with provenience, caliber, grain, and headstamp information. Though often overlooked, such materials provide an opportunity to explore questions about contemporary hunting behavior. This poster introduces the cartridge dataset and outlines potential analytical approaches. GIS mapping is used to



examine whether casings are more frequently associated with particular landforms or located near big game migration routes. Cartridge attributes such as caliber and manufacturer are summarized to investigate possible trends, while statistical tests are used to evaluate variation across spatial or contextual groupings. While analysis is ongoing, this project highlights how recording modern material culture contributes to integrated datasets and opens avenues for linking present behavior to broader archaeological questions.

Not Just Archaeology: Stable Isotopes and the Multifaceted GRSLE Dataset

Authors: C. Orngard, L. Todd, D. Dalmas

The GRSLE Project records more than just traditional archaeology. By documenting lithics, faunal remains, historic debris, modern traces, and ecological materials, GRSLE creates an integrated dataset that allows us to ask new questions about how landscapes were used in the past. This project explores one such avenue through a basic experiment in stable isotope analysis. An elk antler collected during 2025 fieldwork will be analyzed for carbon and nitrogen isotope values, which can provide insight into the seasonal diet and trophic status of the elk during antler formation. While preliminary, this case highlights how GRSLE’s multifaceted data structure facilitates diverse forms of experimentation. By linking biogeochemical signals with artifacts and ecological traces, we can expand interpretations of hunting, animal ecology, and human–environment interaction. This study demonstrates how even small-scale projects can contribute to and benefit from the cumulative, context-rich framework developed by GRSLE.



You Can't Hide Your Drinking Habits: Tracking Elk with Oxygen Isotopes in Wyoming

Authors: E. Milton, C. Widga, K. Barker, and L. Todd

The GRSLE Project examines archaeological and ecological records in the Washakie Wilderness, with a recent focus on multi-species migration and human-animal interactions in the Greater Yellowstone Ecosystem. Stable carbon and oxygen isotope analysis of faunal tooth enamel offers a powerful tool for reconstructing seasonal mobility, dietary shifts, and climatic change. However, accurate interpretation of isotopic data depends on well-characterized, environmental reference baselines. This poster presents stage one of an isotopic survey of the Greybull River Basin, focused on modern surface waters and elk scat. Following IAEA protocols, samples were collected across diverse waterbody types (streams, wetlands, rivers, ice patches) over different seasons to evaluate spatial and temporal variability in oxygen and hydrogen isotopes. Meanwhile, elk scat representative of spring and fall 'movements' help to establish seasonal variation in carbon and nitrogen. Results will strengthen isotopic analyses of archaeological materials from the region and contribute to broader hydrological and ecological research.



Caught on the Wire: Archaeology of Boundaries in the Greater Yellowstone Ecosystem

Authors : L. Todd and Kristin Barker

Fences. Archaeologists usually dislike them, and they often obstruct fieldwork. But what if we treat fences not only as obstacles, but as evidence? During the 2025 GRSLE field season we expanded our inventories to include systematic documentation of fence posts and barbed wire. Inspired by ecological research on the impacts of fencing on wildlife movement, we asked how such features might serve as archaeological data for assessing human influence on high-elevation landscapes. Several fences documented above 3,000 m (>9,800 ft) directly intersect known elk migration routes, yet do not align with current Forest boundaries or historic grazing allotments. Why were these boundaries established, and what do they reveal about past land use? This poster describes our documentation methods and argues that incorporating "recent" boundary features into archaeological inventory provides new perspectives on the interplay of human practices, wildlife ecology, and long-term cultural landscapes.



Small Animals with Big Data: An Application of Microfaunal Analysis at the Bugas-Holding Site to Interpret Past Environment and Ecology

Authors: Daniel Dalmas, Lawrence Todd, David Rapson, Alexis Holyfield, and Kayla Riby

The presence of microfaunal remains at the Bugas-Holding site in northwestern Wyoming provides an exceptional window into the ecological context and seasonal environment in which past human groups lived. Excavations here revealed a single occupational event centered on bighorn sheep (*Ovis canadensis*) and bison (*Bison bison*) hunting, indicating a winter camp of four to five months duration. Taxonomic identifications of associated mammalian and avifaunal remains corroborate this interpretation. By integrating zooarchaeological data with the documented seasonal behaviors of these species, we build a compelling case for winter use of Bugas-Holding. We also compare recovered avifaunal remains with modern avian populations recorded through summer bird counts conducted by the GRSLE Project between 2023 and 2025. This comparative approach highlights the differences between past and present avifaunal communities while situating Bugas-Holding within its broader ecological setting. This study demonstrates the value of interdisciplinary approaches for refining interpretations of site seasonality and human-environment interactions.



Modeling Archaeological Landscapes and Ungulates in the Absaroka Range Wyoming

Authors: Paul Burnett, Lawrence Todd, and Kristin Barker

We model probability surfaces for archaeological landscapes and four ungulate taxa across the Absaroka Range, Wyoming: elk, bighorn sheep, deer, and pronghorn. Models are trained on vetted site locations and species occurrence records using an array of environmental predictors. Performance is evaluated with cross validation, and we compare spatial correspondence between each ungulate surface and the archaeological surface. Patterns show that some species align strongly with archaeological probability, while others align weakly or not at all. In the context of ethnographic accounts, these models help frame land use by identifying where archaeological potential coincides with ungulate use and where it does not. This research advances understanding of past montane occupation as it relates to ungulate procurement.



Designing Research with Little Big Data: Lithic Material Studies in Northwestern Wyoming

Authors: R. Hamada, D. Dalmas, L. Todd

The GRSLE Project has systematically documented over 250,000 artifacts in northwestern Wyoming since 2002, providing an exceptional foundation for regional scale research. This poster outlines a new study investigating lithic raw material diversity across Paleoindian, Archaic, and Late Prehistoric periods using temporally diagnostic projectile points (N=1825) from the cumulative, artifact-based database. We introduce the project design, methods, and goals, emphasizing how ArcGIS and RStudio can be used to analyze raw material distributions across time. Our aim is to evaluate whether increasing population densities in the region led to greater reliance on local stone resources, or alternatively stimulated broader interaction and exchange networks reflected in more diverse lithic assemblages. This poster presents the research framework and early stages of analysis, setting the stage for future results and interpretation.



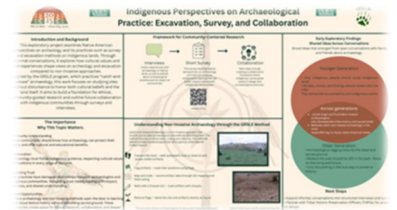
Indigenous Perspectives on Archaeological Practice: Excavation, Survey, and Collaboration

Author: Naomi Gilmore

This project is an exploratory study of Native American perspectives on archaeological survey, excavation, and surface-level practices on their land. Instead of formal research, it begins with informal conversations and reflections to see how cultural values and lived experiences shape views on excavation compared to non-invasive or minimally altering methods. The goal is to establish a baseline of perspectives and highlight Native voices whose lands and histories are often the focus of archaeological work.

This work also demonstrates how future research could be conducted more formally. On the poster, I will include example surveys, sample questions, and a roadmap showing how this

project could grow into a larger study. Future steps will include surveys that compare opinions on excavation versus non-invasive techniques, interviews with tribal leaders and landowners, and participatory workshops. As preliminary groundwork, this project shows how exploratory conversations can guide respectful and collaborative archaeology.



Modern Disturbance and Artifact Distribution: A Case Study of a Two-Track Road

Authors: S. Hale, L. Todd, D. Dalmas, and C. Orngard

During the 2025 GRSLE field season, one of the most intensively studied localities was a two-track road running through the center of our inventory block. Artifact density was markedly higher in the road than in adjacent surfaces raising questions about how modern disturbances affect archaeological visibility and integrity. This study explores several potential mechanisms underlying this pattern. Erosion and bioturbation (e.g., rodent burrowing) can expose subsurface artifacts. Conversely, vehicle traffic can fracture artifacts, thus inflating counts by reducing larger lithics into smaller fragments. This is being evaluated through comparative experiments with flintknapping and vehicular impacts. Surface visibility and collection bias are also considered, as well as suggestions that many exposed artifacts have been taken by campers whose use is evidenced by modern fire pits. By examining these processes, the poster assesses how two-track roads complicate interpretation of artifact density and site significance in forest contexts.



Glass Beads in the Backcountry: Contact-Era Trading in the Absaroka Mountains

Authors: J. Wagemann, D. Dalmas, K. Wilson, and L. Todd

Using the artifact-based survey from the GRSLE Project in the Absaroka Mountains of northwestern Wyoming, documentation has shown there to be the presence of multiple glass bead clusters. These finds provide an opportunity to examine how Euro-American trade goods entered this area. Initial research centers on historical records from U.S. forts, which include evidence of trade and exchange, as well as accounting for other firsthand documents and archaeological evidence from similar contexts in the Northern Plains and Rocky Mountain area. The combination of these aims to examine the spatial distribution of bead clusters to consider their implications for reconstructing trade networks in that area. By situating the GRSLE bead clusters within broader historical and archaeological frameworks, this research contributes to understanding the dynamics of trade, exchange, cultural tradition, and interactions in the Northern Plains and Rocky Mountains during the Contact period.



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Charles **Orngard** - Iowa State University
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Kayla **Riby** - University of Utah
Dr. Lawrence **Todd** - GRSLE, Colorado State University, University of Wyoming
Jackson **Wagemann** - Lawrence University
Dr. Chris **Widga** - Penn State University
Dr. Kurt **Wilson** - Lawrence University

If you or anyone you know might be interested in coming to do the sort of archaeology you've seen here next summer, here's the real poop:

Volunteer Opportunity of a Lifetime: Mountain Archaeology 2026



- Long hours
- No hot water or showers
- Long, steep, difficult, and rocky trails
- Rapid, ice-cold rivers to cross*
- Heavy packs*
- Blisters and sunburn*
- High elevation with limited oxygen*
- Short rations and limited choice of freeze-dried meals
- You supply your own camping/backpacking gear (30 lb [14 kg] personal gear limit when using pack stock)
- Grizzly bears*
- No pay (but you do get to drink your dishwater)
- Long days in the saddle on difficult trails
- Rain, lightening, hail, and maybe snow*
- Leave no trace defecation - use only naturally available objects (i.e., wiping stones)
- No days off - in the back country for one long field session
- No cell phone/internet connection
- Not allowed to confuse methods with methodology
- Periods of tedious, repetitive, seemingly endless data collection
- Spectacular, backcountry fieldwork in Wyoming's Washakie Wilderness at the eastern edge of Yellowstone Park, USA.
- Wildflowers, waterfalls, snowcapped peaks, and abundant wildlife
- Amazing high elevation archaeology

If this sounds like how you'd like to spend 30-40 days sometime in June, July, & August, 2026 and you'd like more information/application forms, please contact Larry Todd (lctodd@grsle.org) or Daniel Dalmas (daniel.dalmas@utah.edu)

<http://grslearchaeology.org/>

*Notice (the fine print): it is only rarely that these conditions co-occur: we seldom have had grizzly encounters while crossing icy streams with heavy packs and severe sunburn while suffering hypoxia during a thunderstorm. And we may not get to ride horses in 2026.