Exploring Regional Landscapes: Integrating Surface and Excavated Datasets, the GRSLE Example

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ROCKY MOUNTAIN ANTHROPOLOGICAL ASSOCIATION
Alamosa, Colorado 2025

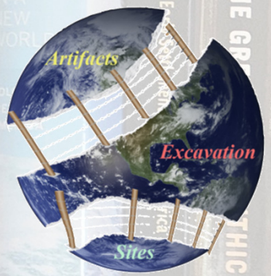
Since 2002, the Greybull River Sustainable Landscape Ecology (GRSLE) Project has emphasized artifact-based inventory of northwestern Wyoming's Shoshone National Forest, primarily from surface contexts, with a particular focus on the Washakie Wilderness. A central goal has been the creation of a single integrated database in which every mapped item—whether from non-collection surface recording or limited test excavations—is tabulated as a distinct attribute. This design allows each object to be included in regional analyses regardless of location relative to arbitrary site boundaries. As of 2025, the GRSLE dataset contains over 270,000 coded items from more than 5,000 hectares of systematically surveyed blocks. Recorded objects range from ubiquitous chipped stone debitage to rare ornamental artifacts, offering a multifaceted picture of regional archaeology. Although rich, these data alone cannot fully address many regional or landscape-scale questions without reference to excavated materials and legacy collections. Interpretations based primarily on surface inventories risk methodological obstacles when addressing increasingly sophisticated behavioral inferences and models. To address this gap, GRSLE has begun incorporating materials from large-scale excavations and existing curated collections into its database. The objective is integration rather than partition: building a cumulative, comparative dataset linking surface and excavated assemblages. This poster illustrates how combining diverse datasets strengthens regional-scale interpretations, enhancing the comparability of archaeological evidence, while supporting more robust models of long-term human land use in the Absaroka Mountains.

GRSLE Field Data Capture

GRSLE+ Collections Data Assembly

GRSLE Data Structure

The Archaeological Data World & often Heavily Partitioned



There are many issues that make researching data to investigate regional archaeological records difficult. We contend that one that has the greatest impact but also is relatively easy to overcome is the tendency to rip the archaeological record apart and to only consider fragments rather than the whole.

Excavation ⟷ Surface Record
Artifacts ⟷ Fauna or Other
Sites ⟷ Landscapes

Bugas-Holding, Wyoming

Since the mid-1980s when the University of Wyoming conducted excavations of the Bugas-Holding site using an integrated, single coding protocol for all types of objects encountered in excavation of this Late Prehistoric winter camp. Since then, variants of this coding system have been used at a wide range of sites (several shown on the left), and it served as the basic for development of the GRSLE coding system.

GRSLE Project, Wyoming

Border Cave, South Africa

Hudson-Meng, Nebraska

Kaplan-Hoover, Colorado

SM1, Ethiopia

MSA Surface Cluster, Ethiopia

Copy of Poster

Our Questions:

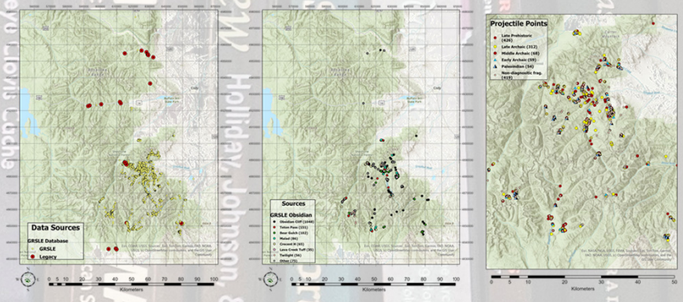
The issues that fascinate us about archaeology often involve large spatial and temporal scales—mobility, foraging, resource procurement, and land use. Addressing these questions is usually framed in terms of a site or an inventory project, but data are often partitioned in ways that make comparison difficult.

- Surface vs. Excavated: recorded and reported differently.
- Sites vs. Isolates: treated as distinct categories.
- Artifacts vs. Faunal Remains or other materials: lithics often discussed as individual diagnostics, while bones are aggregated into groups.

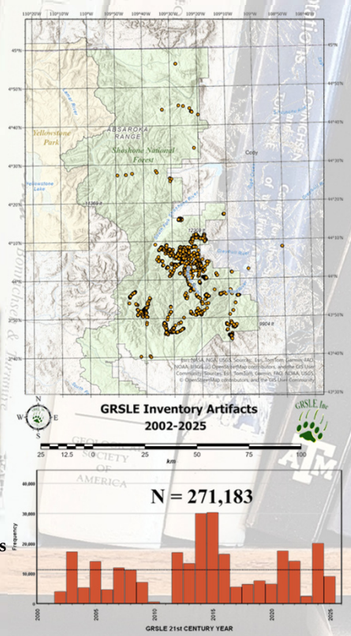
Comparing datasets collected in different ways, at different scales, and across varied groupings is difficult at best.

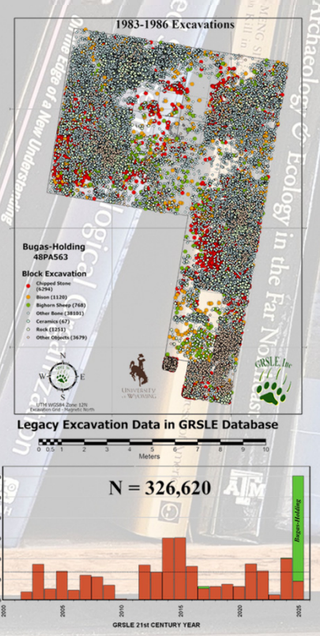
Our Approach:

Our work is based on the idea that basic documentation is best accomplished at the object level. By coding each artifact or feature as a distinct entry, we avoid beginning with assumptions about association (e.g., "site" vs. "scatter") and instead build a cumulative dataset that supports comparison across contexts, classes, and scales. Recently we have begun working to add data initially generated by other projects into our analytical framework and have begun including previously curated materials from excavated sites like Mummy Cave, Dead Indian Creek, Goff Creek, and Bugas-Holding or from older surface collections. Several examples of the evolution and use of this integrative approach are shown here.



Examples of regional extent of GRSLE and Legacy data sets





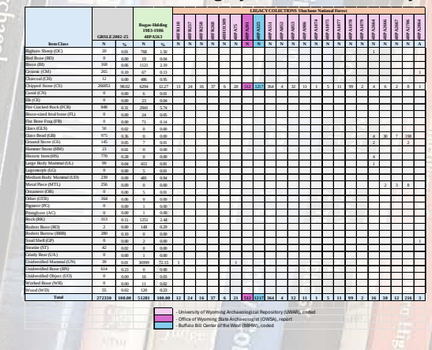
48FR260, Wyoming 1977

48FR257, Wyoming 1977

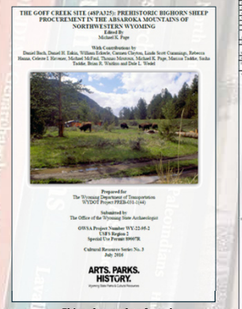
48FR258, Wyoming 1977

Examples of clusters documented in the 1970s that have had collected artifacts coded using GRSLE format and included in the database.

GRSLE Field Data & Legacy Collections Summary

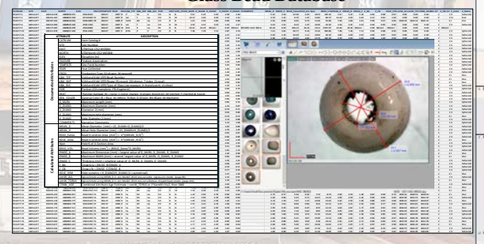


Chipped stone data from the Goff site report are integrated into GRSLE+



The basic GRSLE+ database is the central focus, the simplified database also serves as the foundation for the development of more specialized data sets for example, glass bead morphology and obsidian trace elements.

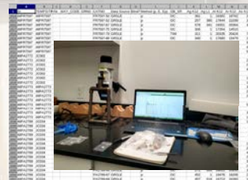
Glass Bead Database



In the table above, one of the material classes listed in both the GRSLE data and from a series of legacy collections are glass beads (GB). Given the specialized information potential of beads, a series of bead-specific data have been assembled in a separate database, that ties directly to GRSLE regional data.

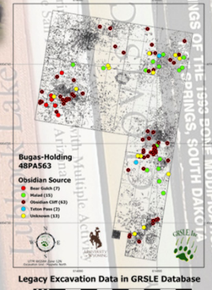
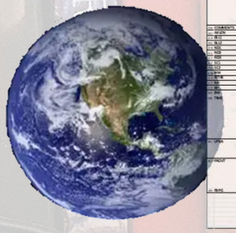
Obsidian Trace Element Database

Drawing on a single variable within the larger GRSLE database can open a web of additional data connections. Obsidian sourcing of artifacts from the Absarokas has employed both EXRF and pXRF methods, leading to the development of an in-house predictive model for identifying sources from XRF scans. This specialized database assigns unique catalog numbers that link individual artifacts to the broader GRSLE database and records up to 53 chemical element values per observation.



GRSLE Obsidian Sourcing Database Summary Table	
Variable	Count
N Artifacts	2591
N Clusters	263
EXRF Reads	1807
pXRF Reads	524
EXRF & pXRF Reads	260
GRSLE Sourced OB	1732
Hughes (2023)	859

Sourced Obsidian



The goal of this data integration is to lessen regional data partitioning and open the doors for wider ranges of research.