Dynamic Land Use Patterns in the Prehistoric Absaroka Mountains, Wyoming

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ABSTRACT. Understanding dynamic land use patterns in prehistoric times is increasingly important as our scientific community strives to make long-term predictions about current land-use changes that affect ecosystems and societies. The Gros Ventre River Basin Landscape Ecological (GRELE) project investigates human-environmental interactions for the prehistoric Absaroka and Gros Ventre Mountains and Yellowstone National Park. The research team sampled materials from 25 diverse, temporally affiliated, and spatially dispersed archaeological sites, and identified the source of obsidian in 53 artifacts. Obsidian is an exotic material with origins at Obsidian Cliff in Yellowstone, but samples were also found in distant outcrops as far as southwestern Utah. Obsidian distribution within the study drainage is indicative of broad social and ecological interactions distinct from extraction of local materials. The variability in the obsidian assemblage suggests that behavioral and environmental changes over time periods, and coupled human-ecological systems, were multiple adaptive systems rather than a single pre-Columbian baseline.

Source Characterization using edXRF

PROJECT AREA

Archaeological surveys have been conducted through the Gros Ventre River watershed for three years. This study area falls largely within the Greater Yellowstone Ecosystem and was chosen for its high degree of geomorphologic complexity. The GRELE project, conducted within the Yellowstone National Forest and Washakie Wilderness Area, is designed to identify the extent of archaeological resources. We emphasize the importance of adaptive strategies for preservation and conservation of all natural resources, of which archaeology is only one component. The survey teams, primarily field school students and researchers from Colorado State University, document the surface record using non-destructive and non-invasive techniques. 26,099 flaked stone artifacts have been observed and documented in the GRELE project. Most of the sites were encountered during non-systematic surveying of the landscape. These occurrences are often targeted by researchers interested in specific time periods or areas.

Assemblage Dynamics

Curated artifacts represent greater utilization of the study area.

- Local materials and quartzite have the largest range of artifacts.
- Evidence suggests that the distinct Obsidian outlier, at 56.2m in maximum length, is the product of recorder errors.
- The variety in length distribution suggests the use of obsidian and local materials suggests differing reduction or use strategies.

Regional Patterns - Scaling Up

The Obsidian sample from the GRELE project reflects the diversity in land-use that is characteristic of the central Rocky Mountains. Cultural areas (Kroeber 1939) are largely defined by adaptation to broad environmental areas.

Defining the Greybull Pattern

47.6% of the 147 prehistoric sites contain obsidian artifacts. The average site contains 10.5% obsidian. Elevation does not appear to be a factor in the site size variability of the entire obsidian assemblage. During 2004, we began to collect samples of obsidian from five geographically distinct sites. 59 samples were collected from 25 sites representing a wide range of site type and location. Artifacts will be analyzed to determine their provenance when complete.

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