The East-West Archaeological Gradient in Southern Wyoming

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Abstract
From east to west, the ecology of southern Wyoming transitions from classic high alpine grasslands to terristriate shrublands to desert brush communities flanked by coniferous forests of the Rocky Mountains. The abrupt transition elicits great contrasts of the regional environment. This study uses GIS and dimensional analysis to study the distribution of archaeological sites and the effect of distance to major water sources in the southwestern part of southern Wyoming. The study identified eight variables as potential differentiators between the eastern and western regions of southern Wyoming: stone mounds, alignments, rock art, stone circles, and standing stones. For centuries, the influence of geography is evident in the placement of archaeological sites documented in the various ecosystems of southern Wyoming.

East-West Ecology
Southern Wyoming is characterized by shrublands in the southwest and grasslands in the southeast.

East-West Archaeology
To explore the east-west archaeological gradient, a search of the Wyoming Cultural Resources Office (WCRO) database was undertaken using custom software developed by SWCA that automates the WYCO search. The search was limited to a strip of land along the southern border of Wyoming using the Sweetwater County north line. The search area encompasses 88 miles north-south by 261 miles east-west, or 31,608 square miles (81,994 square kilometers). The combined WYCO search resulted in the identification over 20,000 prehistoric records. These sites were coded according to the presence or absence of a number of artifact and feature types. Site centroids were created using another custom software program developed by SWCA. This program interfaces with the Blum geomarkings/geomarkings website’s “Grid K” website service to generate polygon vertices for specified FDS locations. The coordinates of the resulting polygon vertices were averaged to produce centroid coordinates for each site.

The Wyoming SHPO provided survey characterize for this region, which show the survey bias in this area.

<table>
<thead>
<tr>
<th></th>
<th>Total Area</th>
<th>Average</th>
<th># of Surveyed Areas</th>
<th>% Surveyed of Total Area</th>
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</thead>
<tbody>
<tr>
<td>West</td>
<td>9,315,140</td>
<td>44.9</td>
<td>586,160</td>
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<td>East</td>
<td>11,370,313</td>
<td>57.5</td>
<td>893,003</td>
<td>78.1</td>
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<tr>
<td></td>
<td></td>
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<td></td>
<td>8.6</td>
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</tbody>
</table>

Surveyed areas in southern Wyoming

Primary and Secondary Lithics/Alignment (n = 1242)

Ceramics (n = 236)

Ground Stone (n = 745)

Kiln Sites (n = 43)

Faunal Sites (n = 320)

Driven Line/Healing Blends (n = 37)

Caves/Alignments (n = 573)

Stone Circle Sites (n = 433)

Lithics (n = 18,037)

RCA analysis of Ranges W, excluding 80W-80M

The principal components analysis shows that the eastern and western groups are completely separated on PC1, which is comprised primarily of:

- Standing stones
- Stone circles
- RCA thermal variables

Dendrochronology and ground stone are the primary components of PC2, and are weak yet statistically significant differentiators of the two groups.

Conclusions
Archaeological patterns in southern Wyoming are strongly separated into distinct eastern and western patterns. The western pattern is characterized by a high frequency of RCA and thermal features, and the eastern pattern by high frequencies of stone circles, cairns, and alignments.

The eastern pattern is predominant from 9950 BC onward, and the western pattern from 7950 BC onward. The area in 880-9800 BC appears to constitute a transitional zone, where elements of both patterns are combined. This could represent the effect of the ecological gradient between the, the Great Basin to the east and the Wyoming Basin to the west.

While some ground visibility may have existed during the western sample, it is not possible to evaluate this hypothesis at present. However, the fact that there is no significant difference between the two areas in terms of lithic artifact frequencies would suggest that differential site discovery is not the dominant factor structuring archaeological patterning at this large scale. A formal test of the influence of surface visibility is needed, though, before this possibility can be entirely dismissed.