

Changes in Montane Watershed Use Patterns Through the Holocene: A Spatial Chronology in the Central Absaroka Range, Wyoming

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Approximately 15,000 lithic artifacts have been documented during 60 days of field research in the montane Greybull, Jack Creek, and N. Fork of the Wood River watersheds in the summers of 2002 and 2003. The location of every artifact was recorded using either a GPS or a total-station (Figure 1).

The extent of data recording per artifact varied between around 35 potential observations for projectile points to only marking the location of artifacts with a GPS.

Digital calipers were used for volumetric measurements (at a minimum) of every lithic artifact.

Data were entered into IPAQ PDAs, which were then merged to the provenience data.

This poster focuses on the amount and distribution of projectile points per time period (Figure 2), using a sample of 151 diagnostic projectile points (of 170 total).

Figure 2: Selected Late Prehistoric (a-y), Late Prehistoric or Late Archaic (z-ae), Late Archaic (af-bh), Middle Archaic (bu-bw), Unspecified Archaic (bi-bt), Early Archaic (bx-ch), and Paleoindian (ci) points from the 2002 and 2003 GRIZ survey.

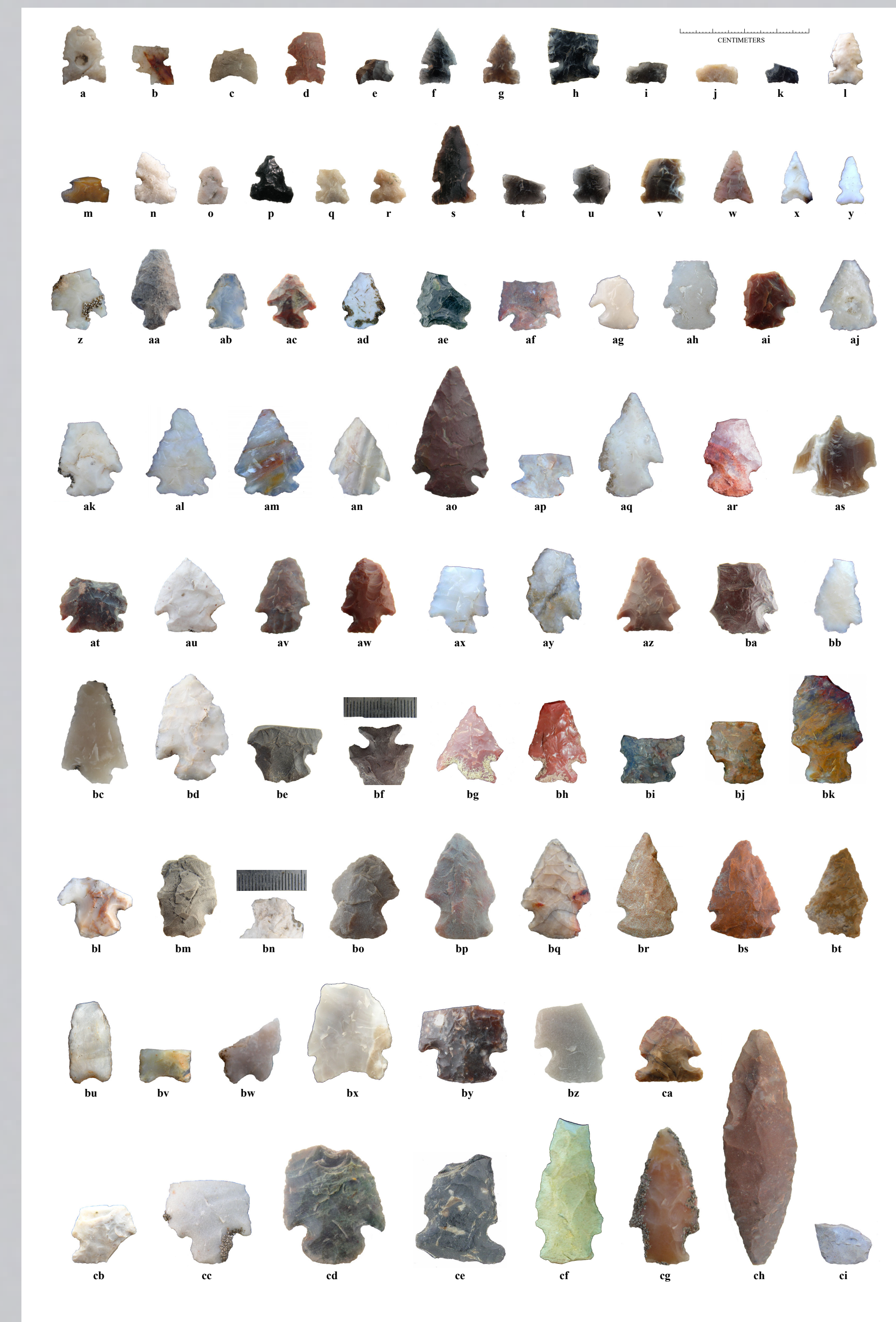
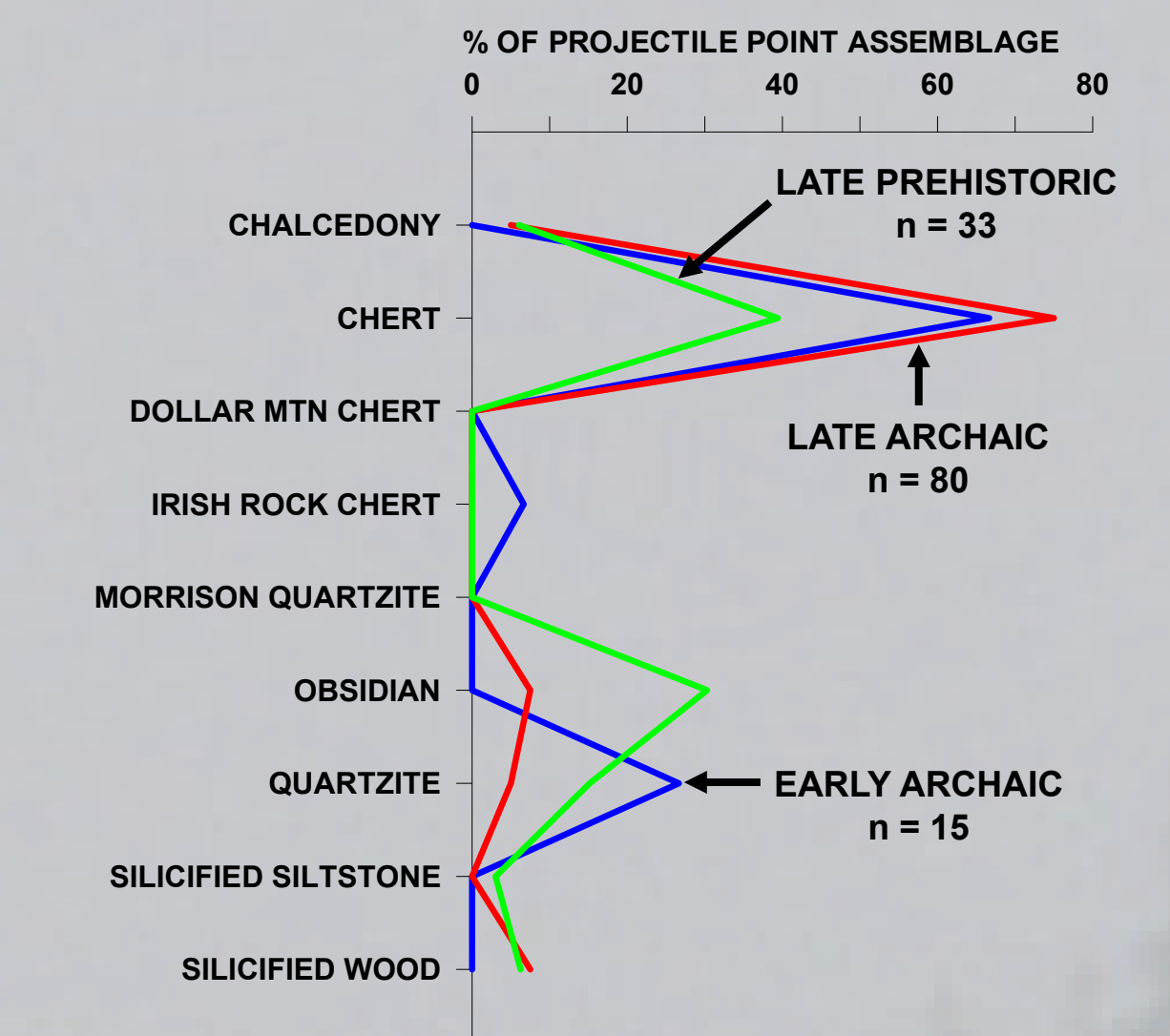


Figure 4: Material type variability for the diagnostic projectile point assemblage.

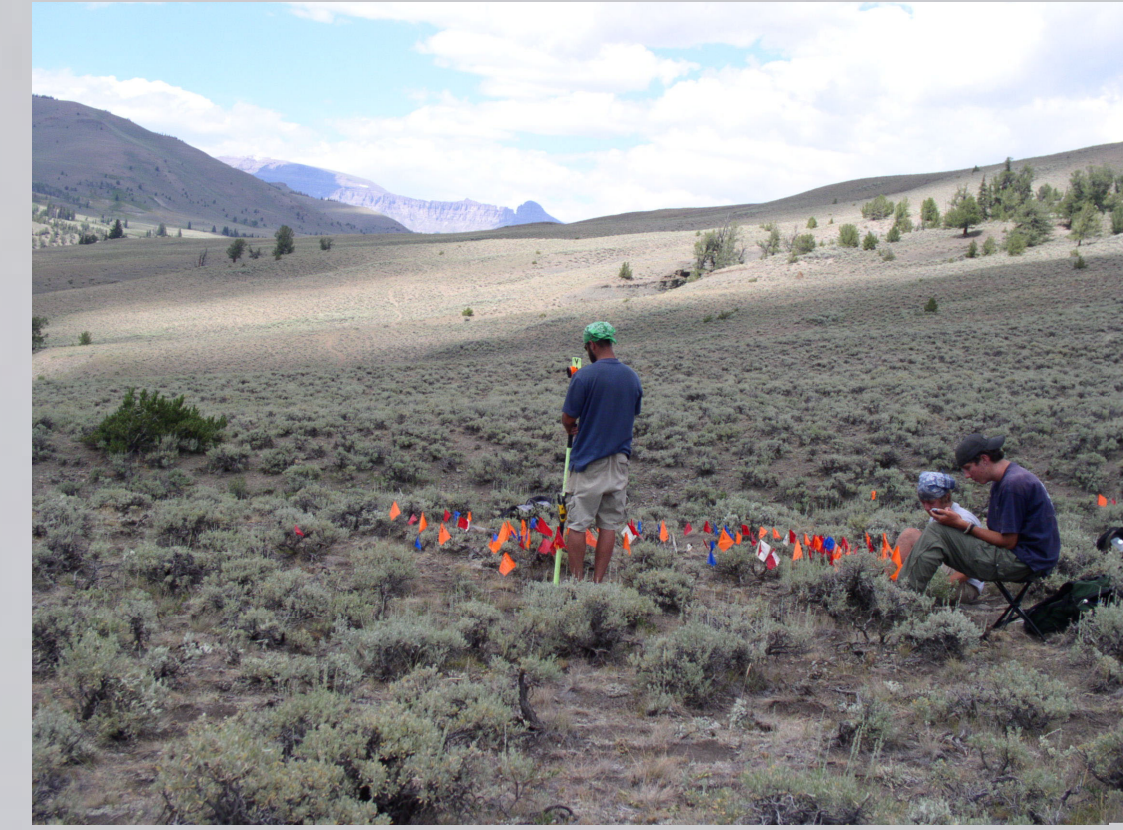


Obsidian knapping was common in the upper Greybull and adjacent montane watersheds mainly during the Late Prehistoric time period (Figure 4), although it does occur in low amounts within Late Archaic artifact clusters.

The Greybull watershed may have been used by Late Prehistoric foragers whose range included part of the northwestern plains and obsidian sources to the west. The Late Archaic marks the earliest time period of intense use of local lithic raw materials. This use continued into the Late Prehistoric.

Early Archaic groups appear to have used mostly nonlocal material, with the exception of the large Dollar Mountain Chert source in the upper N. Fork Wood River.

Figure 1: Students recording every visible surface artifact in a dense lithic cluster *in situ* using IPAQ computers, digital calipers, and a range of provenience equipment including handheld and sub-centimeter GPS and EDM total stations.



The Late Prehistoric (ca. 200-1500 B.P.) points in the Greybull area are easily comparable to those found throughout the northern plains and surrounding areas (Figure 2: a-y). Most of these are Plains Side-Notched points that post-date 600 B.P. (Figure 2: a-r). The Late Prehistoric occupation appears very light from ca. 600 to 1500 B.P. (Figure 2: s-v). One Rose Spring point (ca. 1200 B.P.) has been documented (Figure 2: z).

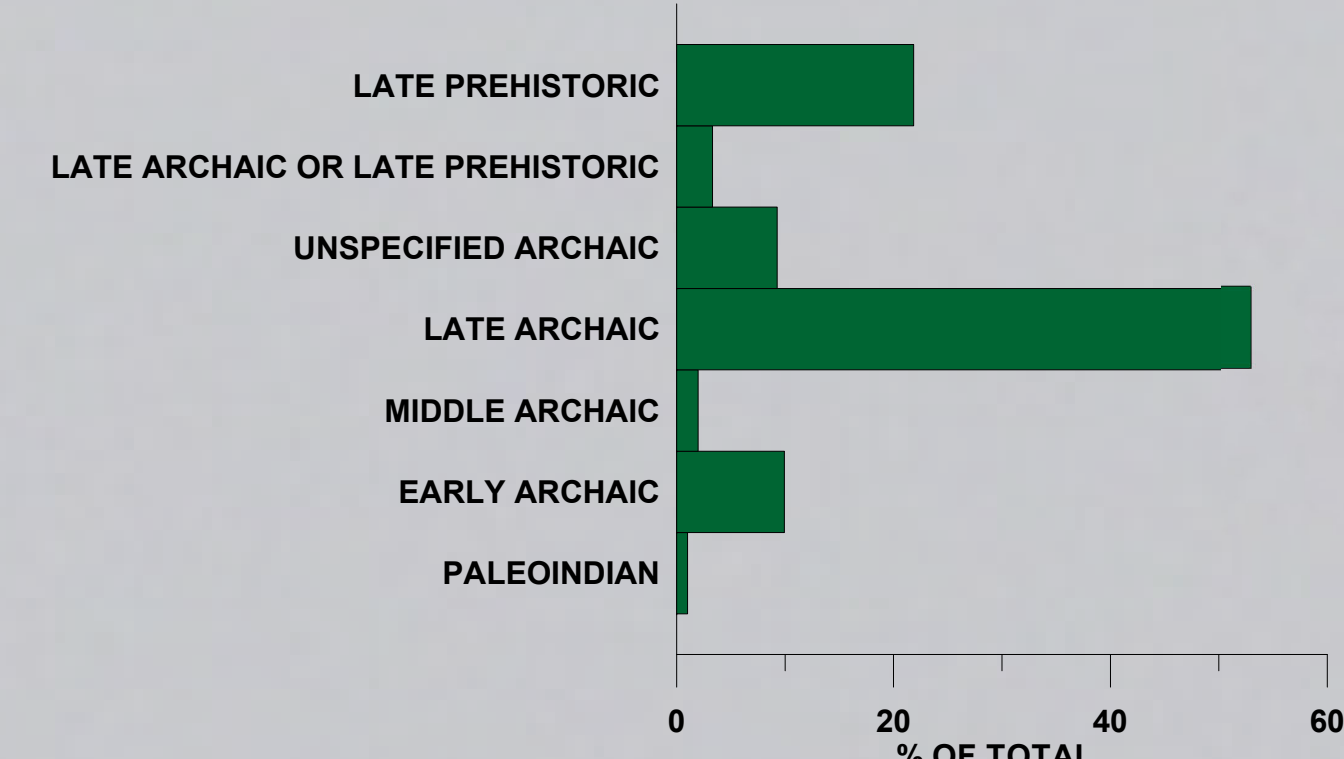
Around 50% of the points are Late Archaic (ca. 1500-3200 B.P.; Figure 3). Few of these are associated with known complexes (e.g. Figure 2: af-bh). Pelican Lake (ca. 3200-1900), a recognized northwestern Plains complex, was documented in two of the montane watersheds (Figure 2: bf-bg).

The Middle Archaic (ca. 5500-3200 B.P.) occupation was very light, with only three projectile points documented (Figure 2: bu-bw). Several of the unidentified Archaic points may be Middle Archaic (e.g. Figure 2: bi-bn).

Early Archaic (ca. 7600-5500 B.P.) points found in low density throughout these watersheds mark the earliest period of significant occupation (Figure 2: bx-ch). Several of the unspecified Archaic points may be Early Archaic (e.g. Figure 2: bo-bs).

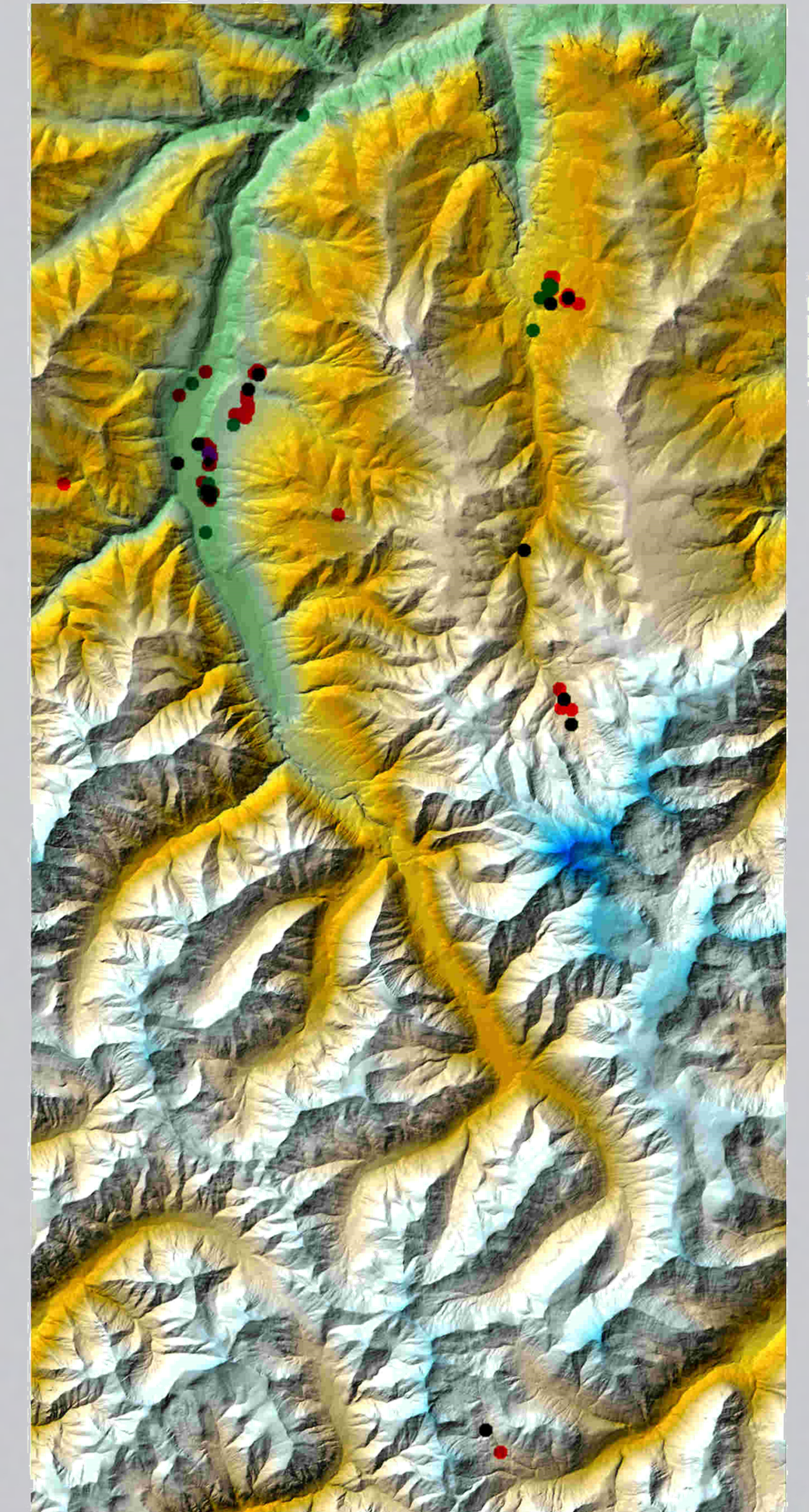
The Paleoindian occupation (pre-7600 B.P.) was light to questionable, with only one base fragment exhibiting Paleoindian characteristics (Figure 2: ci).

Figure 3: Abundance of projectile points per time period (in % of total diagnostic point assemblage).



The spatial distribution of 151 diagnostic points in four montane drainage basins may be a function of changes in land use patterns through the Holocene. Late Prehistoric points were documented in the middle and lower parts of these watersheds, while Archaic material was documented in the middle and upper montane watersheds (Figures 5, 6, and 7). The one possible Paleoindian base was documented in the middle of the Greybull montane watershed.

Figure 5: The distribution of projectile points documented in the montane Greybull and surrounding watersheds. The areas of most intense surveying correlate with the dense point clusters.



The distance between each projectile point and the bottom of the montane watershed was calculated using a digitizer on a digital 7.5 minute USGS map. Trails were followed in the digitizing process when they followed major streams or led directly to the bottom of the watershed. Streams were followed when trails were not available. These distances were divided by the distance from the base to the top of each montane watershed to produce a percent scale, which is useful for interbasin comparisons (Figures 6 and 7).

Figure 6: The mean and range distance up the watersheds where diagnostic projectile points were documented. Distances were converted to percent distance up the watershed (with 100% being the top of the drainage basin) for comparative purposes.

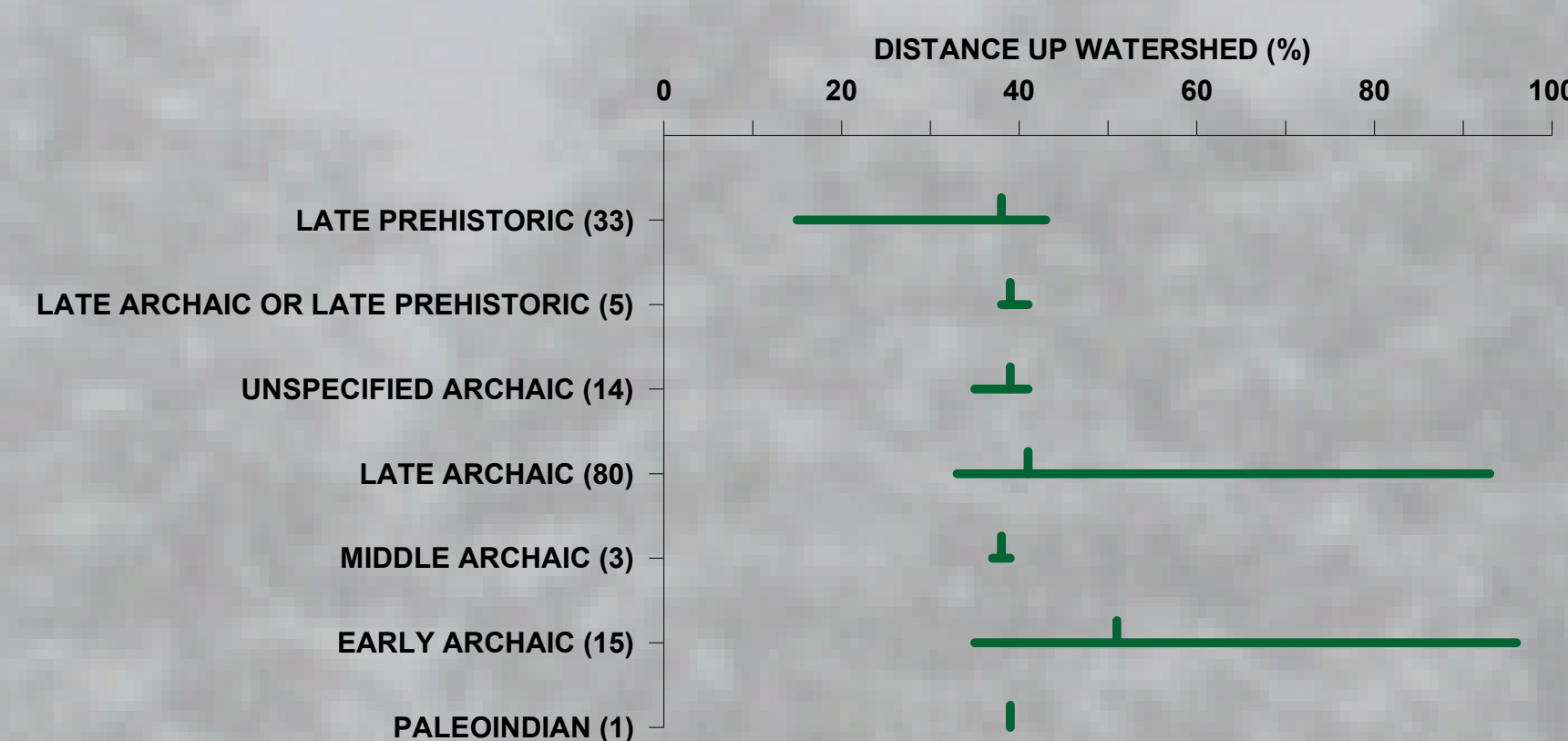
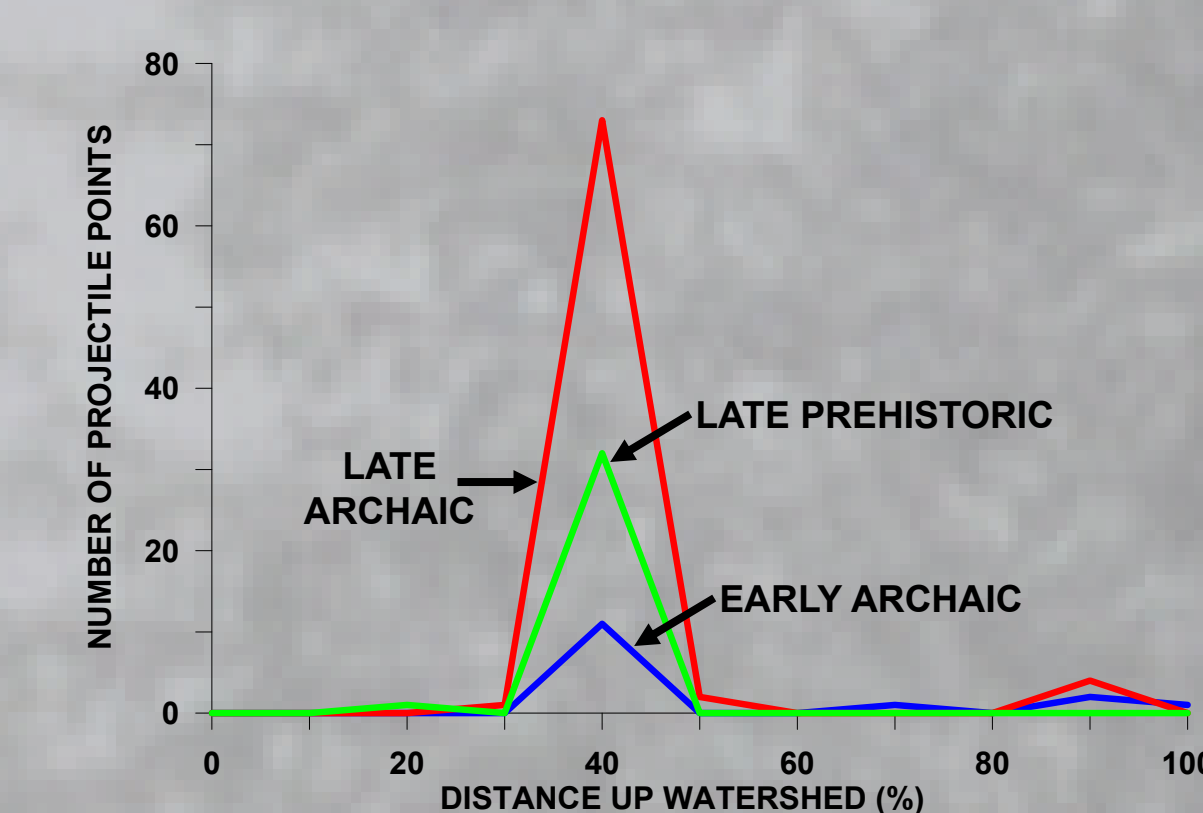


Figure 7: Number of projectile points documented in the different sections of the watersheds. Distances are in percent and were rounded to the nearest 10%.



Site JC003 (Figures 8 and 9) is a good example of the high amount of projectile points documented around 40% up the montane watersheds. The site is a palimpsest of Late Prehistoric and Late Archaic occupations, but cluster analysis may allow a horizontal seriation.

Figure 8: Site JC003 setting. See Figure 5 for location. Note the homogeneity of the topography and vegetation.



JC003 was recorded in 9 days with crews varying from 12 to 4 people, generating around 3870 lines of data.

One cluster in the northwest corner of the site (Figure 9) contains several Late Prehistoric projectile points that may represent the stylistic variability of projectile points carried by one group.

Most of the projectile points documented adjacent to the major streams are base fragments. These are interpreted as waste from tool maintenance activities.

Large palimpsest surface clusters and scatters such as JC003 occur throughout the flat lands in the middle of the Greybull and Jack Creek montane watersheds.

By analyzing attributes of diagnostic lithic clusters (i.e. those with a diagnostic projectile point), it may be possible to recognize both trends and idiosyncrasies in the prehistoric raw material economies – potentially allowing nondiagnostic clusters to be dated on the basis of raw material attributes.

Conclusions

- The middle sections of the Greybull and Jack Creek watersheds were used by groups during all major prehistoric time periods (i.e. Late Prehistoric, Late Archaic, Middle Archaic, and Early Archaic, and Paleoindian).
- Late Prehistoric material has not been documented in the upper half of these watersheds. Most of these are post-600 B.P. styles.
- Late Archaic material occurs throughout the middle and upper watersheds. These groups also had a familiarity with small local lithic sources (e.g. silicified siltstone and wood, chalcedony, and chert). Both of these patterns are consistent with a significant mountain adaptation.
- The Middle Archaic occupation appears very limited and confined to the middle reaches of the watersheds.
- Early Archaic material occurs in the upper half of the Jack Creek, Greybull River, and Wood River watersheds. A knowledge of small local sources has not yet been demonstrated for Early Archaic material. These occupations may have been spurred by the altithermal climatic event (Figure 10).
- Only one possible Paleoindian point has been documented among the 151 diagnostic projectile points.

Figure 10: Oxygen isotope (i.e. temperature) data from the GRIP and GISP2 ice cores, Greenland, for the last 10,000 calendar years as compared to the sequence of occupations in the upper Greybull and adjacent watersheds.

Isotopic data provided by the National Snow and Ice Data Center, University of Colorado, and the National Geophysical Data Center Boulder, CO.

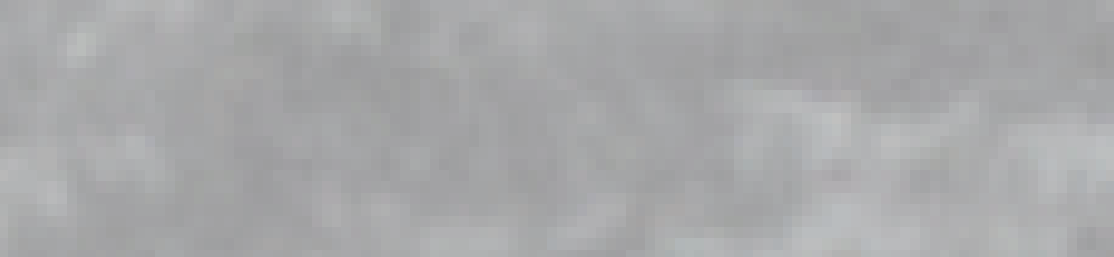


Figure 9: 3336 individually mapped and documented lithic artifacts at JC003 - a typical but relatively large site. Note the variability in point styles within the artifact clusters. Also shown is a steatite bead and pendant.

