

# Assessing Alpine Artifact Abundance and Depositional History of the Greybull Ecosystem, Wyoming

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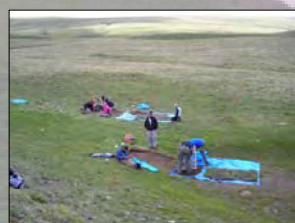
Geomorphology and archaeology are richly interconnected on many levels, one such aspect is the interaction of depositional processes and artifact burial. In 2006, Colorado State University conducted test excavations in the greater Yellowstone ecosystem in the Absaroka mountain range, Wyoming. Test units were laid down to evaluate below surface artifact density, and how the frequency of these artifacts relates to geomorphological processes. Research evaluates deposition of sub-surface artifacts between two test units. The location of the two test units (T and U) were along a slump that led down to a sag pond. Higher along the slump was the T-unit, while U was further down and closer to the sag pond. Due to erosion and depositional forces, the T-unit contains a higher artifact frequency because of the relation to its location on the landscape and sag pond. Methods used for data collection included; use of an EDM to lay down the test units and piece-plot artifacts and samples, excavation of two- one by two meter units, and collection of sub-surface artifacts. This research is important because it shows geomorphologic forces, that effect artifact movement beginning in at least the Early Holocene.

## Introduction-

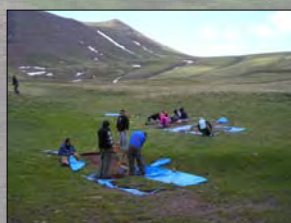
When conducting fieldwork, archaeologists have encountered problems with artifact deposition (Rick 1976, Kornfeld *et al.* 2001). Post-depositional changes are often the result of geomorphological phenomena including erosion, displacement of artifacts due to wind, or simple gravitational pull on downslope movement (Rick 1976). As a first step in comprehending these processes, artifact frequency must be analyzed to understand depositional history. Though shallow sites have many similarities (Surovell *et al.* 2005) each must be treated separately to understand its own unique history and site 48PA2874 is no exception.

## Background-

Site 48PA2874 is situated in a high-altitude, montane environment in the greater Yellowstone ecosystem, Northwestern Wyoming. Specifically, the site surrounds a sag pond with slump hills that are particularly steeper on the east and south side of the ephemeral pond. The two test excavation units were used to find below-surface artifact frequency and to evaluate post-slump deposition. The lithics found in each unit were recorded to help evaluate geological processes affecting archaeological artifacts.



Eastern view of the excavation units



Northeastern view of the excavation units



Northern view of the excavation units

**Acknowledgements:** Thank you to all the other students in the 2006 field school for making it a great summer and a fun learning experience; and being able to keep up great attitudes- fire or not. To Dr. Todd for making field school a great experience, being patient, and teaching us so much. Thank you Dr. Todd for co-authoring the poster and for always being there to help out with the over-all project. Thank you to Mom and Dad for supporting me going to field school and calming any apprehensions about it. Everyone involved in the process made it an unforgettable experience!

Figure 1



Figure 2



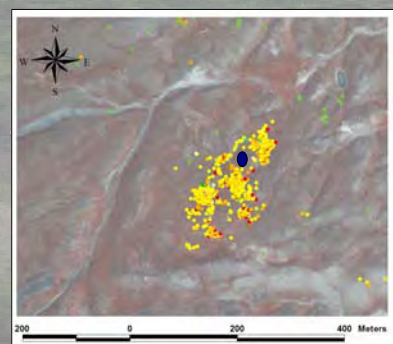
Figure 3



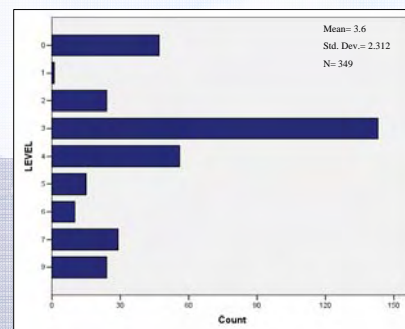
Figure 4

## Methods-

Elevations of unit surfaces were collected prior to excavation with an EDM (Figure 1). Surface artifacts were piece-plotted and collected in each unit (Figure 2). The excavations were conducted in two, one-by-two meter square units. Units were then divided into two units that were one-meter square each. Each meter was excavated in fifty-centimeter units to a depth of five centimeters for each level (Figure 3). All artifacts larger than one centimeter found *in situ* were mapped using the EDM (using WGS84 UTM coordinates). Ending elevation measurements were taken in the middle of each fifty-centimeter square unit after a level was completed. Sediment from each fifty-centimeter square unit was dry screened through 1/8" wire mesh screen (Figure 4). Artifacts found while screening were collected, bagged, and labeled for later washing and coding in the lab.



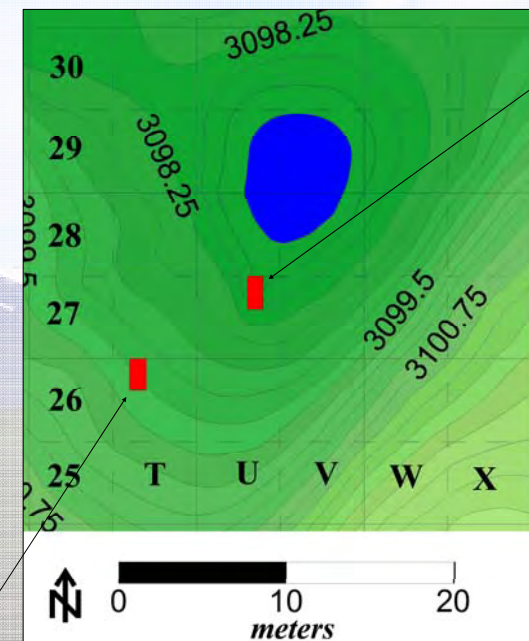
General site map of 48PA2874. Location of the dried-up sag pond is indicated by the dark blue circle.



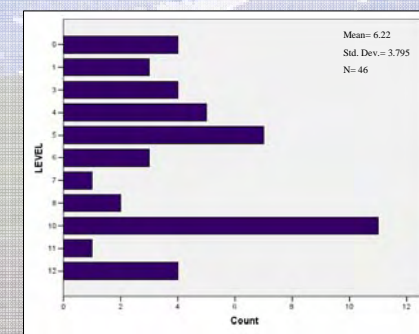
Graph 1- Total artifact distribution of the T-unit.



T excavation unit.



Graph 2- Total artifact distribution of the U-unit.



## Results-

The T-unit had a higher frequency of artifacts compared to the U-unit. Each unit is summarized separately below.

### T-26

- Had a total of 349 artifacts between units T26-6 and T26-7 (Graph 1).
- Both had the most artifacts in level 3, accounting for 41% of all lithics found in the entire T26 excavation unit.
- No lithics were found in either T26-6 or T26-7 in level 8.

### U-27

- Had a total of only 45 artifacts in both U27-16 and U27-17 (Graph 2).
- Average number of lithics found in each level was only 4.
- Level 10 had the highest frequency of lithics with 11, and in neither level 2 nor 9 had artifacts in both U27-16 and U27-17.

## Conclusion-

The results presented are in concurrence with the initial hypothesis, which states that because of its location on the landscape in relation to the sag-pond, and due to post-depositional forces the T unit had a higher frequency of artifacts compared to the U unit. Though other phenomena such as gravity could be implied for this lithic patterning, erosion is the main cause of post-depositional artifact displacement at site 48PA2874. This is not indicated only by artifact abundance but sediment and over-all rock size compared between the T and U units (Gingerich, 2006). This research doesn't only have implications for high-altitude sites, but any site in which archaeologist must grapple with excavations being conducted on a hill or slump surface where erosion forces change post-depositional patterning.

## Resources

Gingerich, Eric  
2006 Sediments in a Slump: Depositional Dynamics in and Around Alpine Sag-Ponds. Poster Presentation.

Kornfeld, M., et al.  
2001 10,000 Years in the Rocky Mountains: the Helen Looking Bill Site. *Journal of Field Archaeology* 28(3/4): 307-324

Rick, J.  
1976 Downslope Movement and Archaeological Intrasite Spatial Analysis. *American Antiquity* 41(2):134-144

Surovell, T., et al.  
2005 Shallow Site Archaeology: Artifact Dispersal, Stratigraphy and Radiocarbon Dating at the Barger Gulch Locality B Folsom Site, Middle Park Colorado. *Gearchaeology: An International Journal* 20(6): 627-649