

Summer Undergraduate Research Fellowship (SURF) 2017 Testimonial

“GPS and Total Station Plane Survey of the Unexcavated 24BE2206 Site in the Big Hole Valley of Montana”,
 Liana Galayda (Civil Engineering), M. Masters, A. Choudhury

“My summer was full of sun, dirt, and pre-historic Native American artifacts and features. I participated in a GPS and Total Station plane survey of a previously unexcavated site in the Big Hole Valley of Montana. First, Professor Choudhury helped me to acquire the GPS coordinates of two points at the site, which we then plugged into the Total Station for later use in surveying. Acquiring the GPS coordinates required the use of OPUS (Online Positioning User Service), which was an entirely new experience for me. At the site, a grid was formed and labeled such that each point referenced the NW corner. This was a very simple and useful method of labeling, and I will likely use it for labeling survey points in the future. A team and I dug one meter units at the site to unearth artifacts and features, which were diligently recorded according to archaeological standards. I learned quickly that these standards involve paper documentation as well as photographic. Then, I used a Total Station to preserve the provenience of these items. However, on the last day, I did not verify that the batteries were in the case with the Total Station, therefore, none of the artifacts found that day were surveyed in. I learned two valuable lessons from this experience. First, always double-check that you have all necessary equipment before leaving for a remote site. Second, plotting the artifact locations from the Total Station is much easier and less time intensive than having to plot them manually. I learned a lot about archaeological methodology and paperwork, acquiring coordinates with GPS and OPUS, and different methods of surveying with the Total Station.”



GPS and Total Station Plane Survey of the Unexcavated 24BE2206 Site in the Big Hole Valley of Montana

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Background & Significance

Archaeological excavations reveal size and social structure, subsistence strategies, time of occupation & site usage for past human groups. When materials are removed from the excavation site, their provenience can be lost if not carefully recorded.



Methods

Leica GS 15 and Leica TS 11 were used to record the location of artifacts and features in order to preserve their provenience.

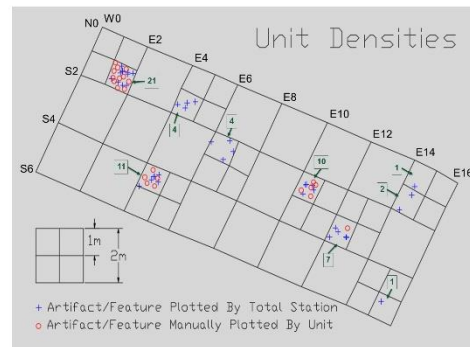
Established GPS base stations with GS 15. Shot all grid points from base stations with TS 11.

As each artifact and feature was revealed, the TS 11 was used to record its location.



Results

Downloaded data from TS, plotted location points in AutoCAD, and elevations in Microsoft Excel. Artifact/feature distribution and densities can be seen in the figures below.



Artifacts & Features



Conclusions

Unit S1E1 yielded the highest number of artifacts at 21, while units S5E15 and N0E14 yielded the lowest at 1 artifact each.

Due to erosion and deposition of material downslope, western units may yield more artifacts over greater depth.

Each excavated unit yielded artifacts, at all depths up to 130 cm below surface level, indicating a long history of usage dating back to at least the Middle Archaic period, and likely well beyond this cultural horizon.

Lessons Learned

Have a well established labeling system before beginning the survey.

Double check that all equipment is in boxes before leaving for the site.

Ensure to survey in additional subdivision of units as dig progresses.

Acknowledgments

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Elevations of Artifacts and Features

