How Accurate are H. P. Mera’s Maps?: A Comparison with Micro-Topographic Spatial Data from the Northern Rio Grande Region, New Mexico

Samuel Duwe and Michael Duwe

Department of Anthropology, The University of Arizona; Sleeping Bear Dunes NL, National Park Service

Introduction

Harry P. Mera, one of the pioneers of New Mexican archaeology, surveyed large swaths of the northern Rio Grande region in the 1920s and 30s, contributing to the understanding of regional settlement patterns, ceramic typologies (Mera 1932), and culture history (Mera 1935). He also created detailed maps of almost 600 large Coalition and Classic Period pueblo sites, many of which today are inaccessible or destroyed. These maps are located in the archives at the Museum of New Mexico, and have been used in countless articles and CRM reports. But the question remains: how accurate are these maps, and can they be successfully used for modern archaeological analysis?

This study examines three large Classic Period Tewa sites in the Rio Ojo Caliente valley, a tributary of the Rio Grande located north of Española, New Mexico. We used a total station to create detailed micro-topographic maps of these sites, and compared them to Mera’s maps based on three measures of accuracy: orientation, observation, and scale.

Mapping the Sites

Three Classic Period Tewa sites, Pose, Hupobi, and Ponsipa, were mapped using a Sokkia total station in October, 2007. Features such as roomblocks, kivas, plazas, rock alignments, and shrines were first identified by walking the site and setting pin flags. Multiple points were shot using a total station and detailed site maps were created in ArcGIS 9.2.

To create micro-topographic surface maps, the sites were gridded into 5 x 10 meter units and points were shot at the corner of each unit. All three dimensional data points recorded were converted into surface maps using Surfer 8.0.

Scaling and Comparison

Mera did not include a scale on his maps, but did label distances between features in feet. However, these distances were apparently measured by pacing (Lou Haecker, personal communication). To further complicate measures, these sites were constructed with adobe and the ruins consist of mound earth. To estimate the location of the actual walls without excavation data is purely guesswork.

Therefore, to scale Mera’s maps to our own we used the least arbitrary feature on each site: the main kiva. These kivas are deep and well-defined. After scaling the maps we overlaid the corresponding kivas, and were able to compare the maps.

Orientation

Mera apparently used true north to orient his maps. For both Hupobi and Ponsipa no rotation was necessary to align the features. Mera’s map of Pose was 4° east of true north, which was determined by rotating his map in ArcGIS. In general, Mera’s orientation is very accurate, and comparable to modern field maps.

Observation

When the interpretations of the sites’ layouts are compared between Mera’s and our maps, it is apparent that the majority of features were recorded on both. Noticeable exceptions take three forms: (1) a difference of interpretation of some features (such as an ephemeral structure in the north plaza of Pose which we concluded was a midden area and a kiva on the west side of Ponsipa which we thought was a natural depression); (2) changes in the sites over 70 years of erosion, grazing, and pot hunting (the southernmost rooms of Ponsipa); and (3) recording of features Mera did not observe (such as the kiva in the southern portion of Hupobi). Each of these derivations are minor and both 1 and 3 are the results of differing views of the same site, a problem inherent in all archaeology.

Conclusion

Based on the factors of orientation, observation, and scale H. P. Mera’s maps of large pueblos in northern New Mexico are incredibly accurate. These maps were created using paced distances and compass bearings, and are nearly as accurate as the maps produced by precise electronic instrumentation. When Mera’s paced distances are converted to meters, archaeologists working in the northern Rio Grande region should feel confident in using these maps not just as guides but also as useful analytical tools to examine demography, site layout, and the use of habitation and ritual space.

References

Mera, Harry P. 1932. Wares Ancestral to Tewa Polychrome Wares Ancestral to Tewa Polychrome. Technical Series, Bulletin No. Four, the Laboratory of Anthropology, Santa Fe.
1935. Laboratory of Anthropology, Santa Fe.

Acknowledgements

This research was funded by the National Science Foundation through a Dissertation Improvement Grant (BCS-0741708). The University of Arizona IGERT program in archaeological sciences provided mapping equipment. Lou Haecker (ARMS, Museum of New Mexico) provided the maps and valuable insight. Janis Duwe and Kelly Lyons assisted in field work and offered additional support.