Non-Site Survey on Monticello Mountain

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1. Monticello Plantation Survey

Beginning in 2007, Monticello's Archaeology Department designed and implemented a research project called the Monticello Plantation Archaeological Survey. The 3,200 acres of the survey are on the hillside tract of land along the Rivanna River currently owned by the Thomas Jefferson Foundation. This tract includes the core of Thomas Jefferson's Monticello Plantation.

In this poster, we briefly describe our approach to archaeological-survey of the Monticello Plantation. We then focus on our efforts to empirically classify the archaeological findings, as well as our approach to dealing with the potential for artifacts whose density varies continuously, with the territoriality of archaeology (called polygons in ArcGIS) in terms of discrete sites.

The Plantation Survey is an example of a systematic non-site survey. We have discarded the notion of site to provenance the artifacts, which we find in the field. Rather, artifacts are provenienced to show Gross Grid (STPs) from which they were recovered. The location of each STP is mapped, whether they yield artifacts or not.

2. Modeling Continuous Density Surfaces with KDEs

A non-site approach allows us to portray the archaeological record as a scatter of artifacts whose density varies continuously across the landscape. This approach is useful in archaeological surveys, where density varies continuously as the landscape.

We use kernel density estimates (KDEs) to convert STP artifact counts into continuous density surfaces. We can map the continuous surface into discrete activity areas. We map three artifact classes: Jefferson-period ceramics (ca. 1740-1830), wrought nails, and wine bottle glass (WBG). We use kernel density estimates (KDEs) to convert STP artifact counts into continuous density surfaces (KDE) to map density scatters.

Density is affected by intensity and duration of use across the landscape. The spatial focus of the survey is a 2,000-acre tract of land along the Rivanna River currently owned by the Thomas Jefferson Foundation. This tract includes the core of Thomas Jefferson's Monticello Plantation.

We use an empirical experiment with how we define sites. We explore variation in density thresholds makes it clear that there are many densities less than our 0.0003 Spearman Kendall. We would characterize these green patches as the locations of multi-year residential occupation of one or more households.

3. Modeling Patches with Density Thresholds

We experimented with density thresholds. KDE is well with values below a given threshold are considered continuous. KDE is well with values above the threshold values (called polygons below). We use this technique to identify clusters of artifacts that can be assigned to occupation by the Kern Density Surface (KDE).

We can visualize the effect of density on how we define patches by plotting the number of patches at equal or greater density threshold for three different density thresholds. Increasing the density threshold to 0.0034 (above) results in a smaller number of patches. Increasing the density threshold to 0.0051 (above) results in a smaller number of patches.

Density scatters result in high-density patches for all three artifact classes. Non-domestic occupations of high intensity or long duration should result in high-density patches even centered on an artifact's spatial location of high density. This is right, we need to distinguish patches from scatters empirically, and we can visualize the effect of density thresholds.

4. Characterizing the Patches

As shown by green polygons below, some ceramic scatters overlap with wine bottle glasses. We think these are the areas as well as regularity of traffic between places. We then focus on our efforts to empirically classify the archaeological findings, as well as our approach to dealing with the potential for artifacts whose density varies continuously, with the territoriality of archaeology (called polygons in ArcGIS) in terms of discrete sites.

We can use this class further by mapping the distributions of nail, ceramic, and wine bottle glass. We can use this class further by mapping the distributions of nail, ceramic, and wine bottle glass. We can use this class further by mapping the distributions of nail, ceramic, and wine bottle glass.

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6. Summary

Systematic non-site survey methodology allows us to portray the archaeological record as a continuous surface of varying density and to experiment with how we define sites.

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