Identification of Unmarked Burial Sites at Frankfort Cemetery using LiDAR and Ground Penetrating Radar

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A common problem faced by genealogist who specialize in assessing the cultural significance of some cemetery locations is the identification of areas containing unmarked burial locations, especially for cemeteries that have lost or lack accurate historical records. This current project involves the characterization of surface and subsurface features of locations suspected of containing unmarked burial locations at The Frankfort Cemetery, located in Frankfort, Kentucky. First, ground-penetrating radar (GPR) verified the existence of several unmarked gravesites and characterized the spatial extent and orientation of the gravesites for a sample area within the cemetery. Next, light detection and ranging (LiDAR) data quantifies surface attributes of the identified unmarked gravesites including surface elevations and signal return intensities. Lastly, the spatial correlation of GPR results are evaluated against the LiDAR results to assess the degree to which the grave features are identified across both sets of results.

Preliminary results reveal a high number of unmarked burials including 15 locations positively identified in one GPR transect of less than 100 feet. GPR transects ran from north to south and indicated the graves to be orientated (lengthwise) east to west as is typical for other locations within the cemetery. In some cases, LiDAR return intensity increases were spatially coincident with unmarked burial sites possibly due settling of burial sites. LiDAR elevation measurements were inconclusive though this processing is ongoing.

These early results suggest that a combination of GPR and LiDAR yield an effective and non-invasive option for identifying unknown burial sites.