

Artifact Density Analysis of an 18th Century Mill in Eaton, Indiana

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Background: In 2021, the Ball State Anthropology Department held an archaeological field school led by Dr. Mark Groover at the site of Hyland's Mill in Eaton, Indiana. The mill existed from the early 1840s until 1891 and served as a grist, sawmill, carding, and textile mill. Powered by the Mississinewa River and steam, the mill was a prominent manufacturer and employer for Eaton. As new research indicates, the mill was intentionally vandalized and burned in September of 1891, coinciding with other attacks on industry in the area. While the motivation of the arson is speculative, the result was the complete destruction of the mill and the shift of manufacturing from Eaton to nearby Muncie. Without surviving property maps and the site cleared, the layout, size, and manufacturing capacity of the mill were forgotten. **As such, the objective of the study was to approximate the layout of the mill, the origin of the fire, and to conclude the post-fire destruction of the site.**

Initial Data: The field school uncovered 10,220 artifacts which were filtered into 7 main categories. These categories ranged from architectural items like nails and bricks to personal items like shoe soles and buttons. Importantly, the categories were duplicated for burned items of each, effectively establishing two filtered datasets, unburned and burned.

Data Processing: The original two datasets were functional in demonstrating the range of the artifacts recovered, but less helpful for spatial analysis. As such, the datasets were adjusted so that every artifact had its own entry and coordinate pair that related to the excavation square from which it originated. From this, the number of artifacts per excavation square served as a Z coordinate, enabling wire density mapping and aerial density views of the site via Surfer Graphing Software (Figures a-d).

Results: There are two main concentrations of unburned artifacts compared to one main concentration of burned artifacts.

- May indicate the origin of the fire and its sequence of growth
- The range of burned artifacts indicates the dimensions of the main mill structure
- Suggests the main mill structure suffered a catastrophic collapse but was not entirely burned.

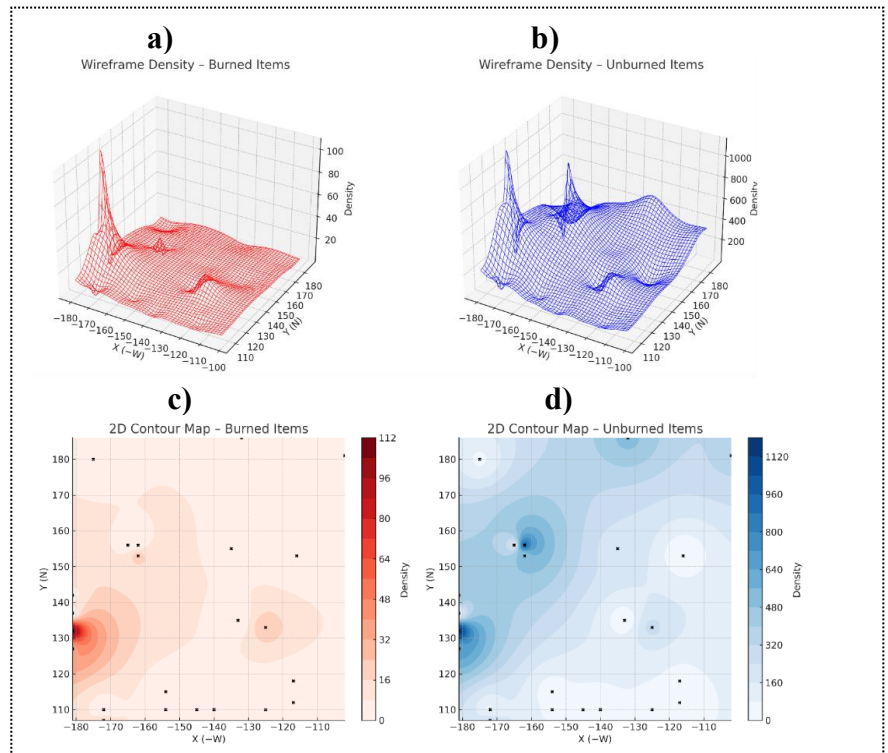


Figure 1. (a) Wireframe of burned artifacts. (b) Wireframe of unburned artifacts. (c) Aerial density map of burned artifacts. (d) Aerial density map of unburned artifacts.

- A smaller and separate concentration of burned and unburned artifacts to the right of the main cluster may indicate the location of a second building.
- The southern excavation squares followed the original mill foundation yet were not densely populated with artifacts, indicating a portion of the site was cleared down to the foundation.
- Dense spots of unburned artifacts could be from either clearing the southern area or discarding from regular milling.

FOR FURTHER READING:

Groover, Mark, et al. "Hyland Mill Field School: Archaeological Investigations, Eaton, Indiana." Ball State University Department of Anthropology, 2021.
Post, John D. "The Flour Mill Explosion of 1878." *Technology and Culture*, vol. 28, no. 3, 1987, pp. 612–36.