

# Where Mountaintops are Found Below the Earth, an Archaeological and GIS Analysis of Sacsayhuaman, Peru



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## Background

Sacsayhuaman is a megalithic archaeological site built by the Inka in the 15th century located atop a mountain that watches over the city of Cusco, Peru - 1100 km east of the country's capital, Lima (Figure 1). It was dismantled during Peru's colonial era by Spanish Conquistadors during the 16th and 17th century<sup>1</sup>. The full use of the site is unknown but has preserved Inka culture through its artifacts. Today Sacsayhuaman is recognized as a UNESCO world heritage archaeological park.

This study investigates how the site was used by the Inka and their relationship to different areas in Sacsayhuaman by assessing various classes of potsherds (Body, Neck, handles, Bases, and Rims) and creating a map of the pottery in a Geographic information system (GIS). The intent of this research is to infer the uses of the site by mapping the pottery assemblages. If different classes of potsherd vary in location and amount, then various areas of the site will have distinct uses.

## Method

To answer how the site was used by the Inka through their pottery, data from the 2001 excavations<sup>2</sup> on Sacsayhuaman were digitized and implemented to the GIS analysis accounting for potsherd artifact totals found (n = 6164), and class of potsherd. Several heat maps were created featuring a points pattern analysis and a colour scale to demonstrate the densities of artifacts relative to their location.

## Results

Using a heat map and point pattern analysis demonstrated that total artifact amounts showed spatial patterning and densities towards the south-western end of the site near a rock face or a huaca,<sup>3</sup> and structural components of a wall (Figure 2). For the different potsherd classes, we can see discernible locational densities of artifacts that vary depending on the potsherd class:

- Potsherd bodies were the most spread out throughout the excavated areas represented, with highest densities within the structures of the site to the east (Figure 3).
- There were minimal amounts of pottery handles, with one very dense location (Figure 4).
- Potsherd bases were spread out through the excavations, with several high densities occurring (Figure 5).
- Pottery rims were spread out in most places other than the very south, with one very dense area (Figure 6).
- Potsherd necks overall were low, but feature four main hotspots (Figure 7).

# Through spatial analysis of archaeological assemblages, we can better understand human relationship to space in Sacsayhuaman

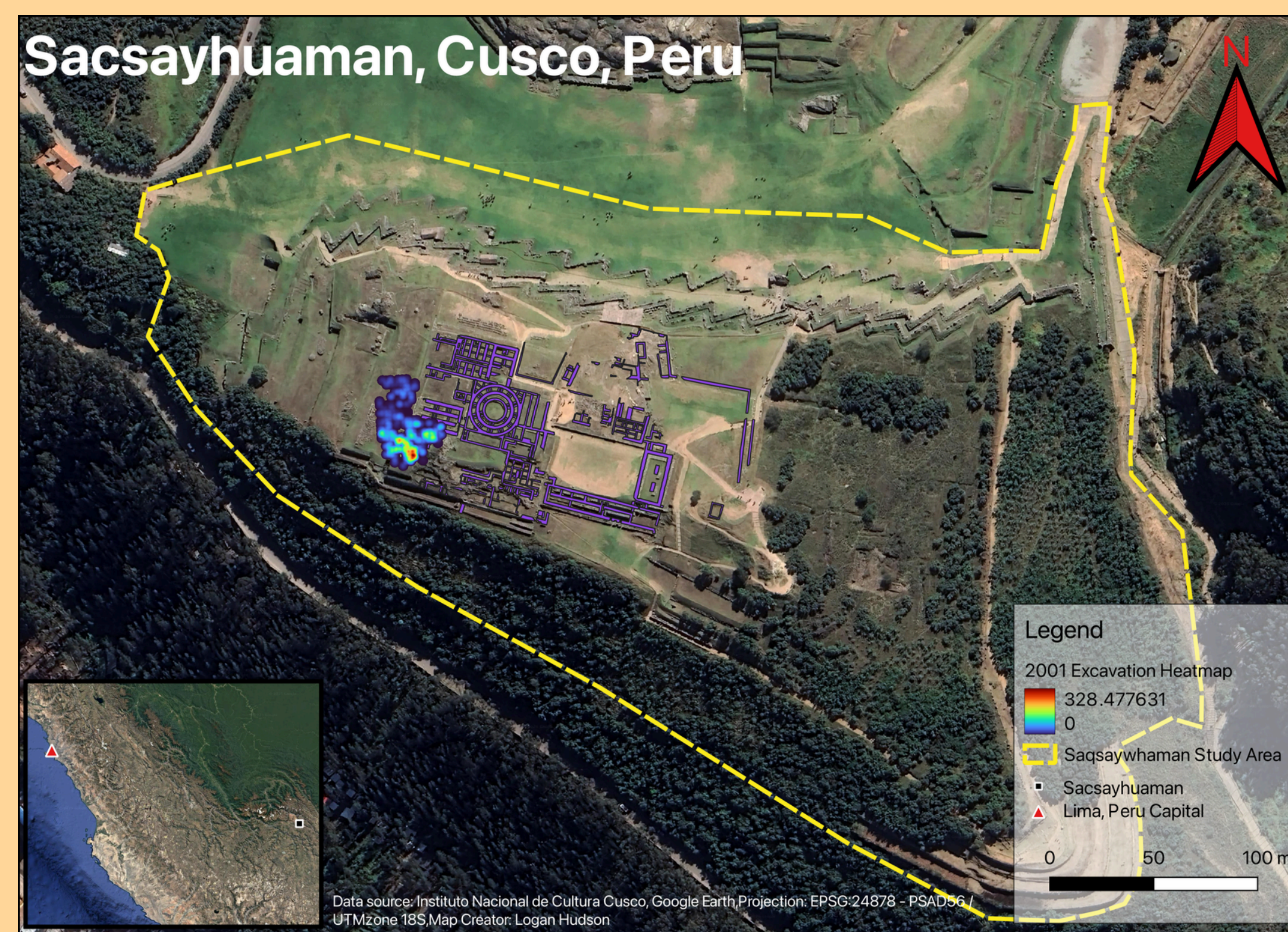


Figure 1

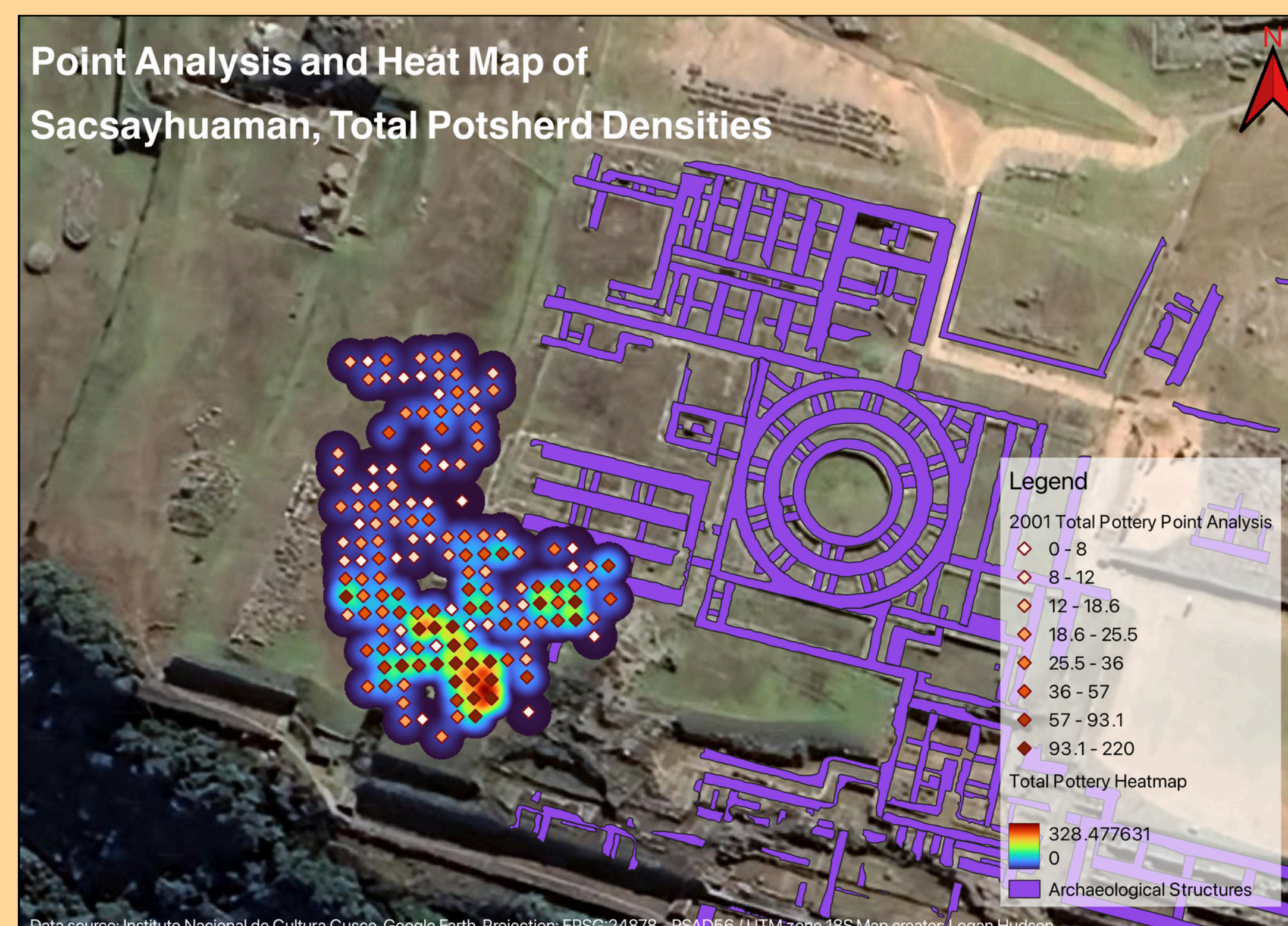


Figure 2

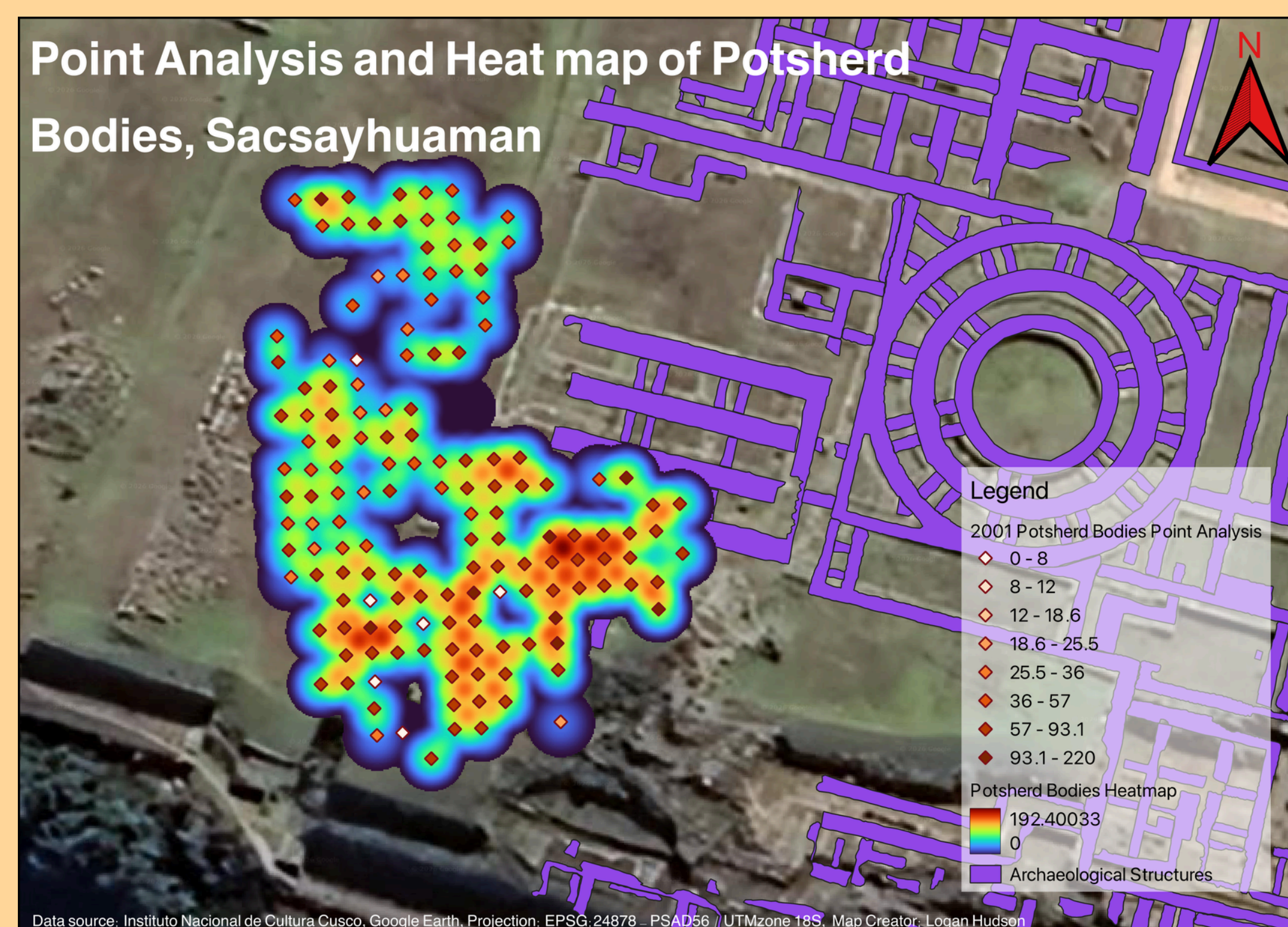


Figure 3

## Conclusion

There appears to be a spatial relationship between artifact location and densities. Different types of pottery have different uses. From this, it can be inferred that there were notable sectional uses of Sacsayhuaman. The southern most part of the site had the heaviest densities of artifacts overall, but different classes had variable thresholds throughout the excavation grid. By being able to use GIS analysis to understand the Inka's relationship to space and their use of Sacsayhuaman through archaeological assemblages and potsherds, it allows for a tangible and powerful way of visualizing human use of space.

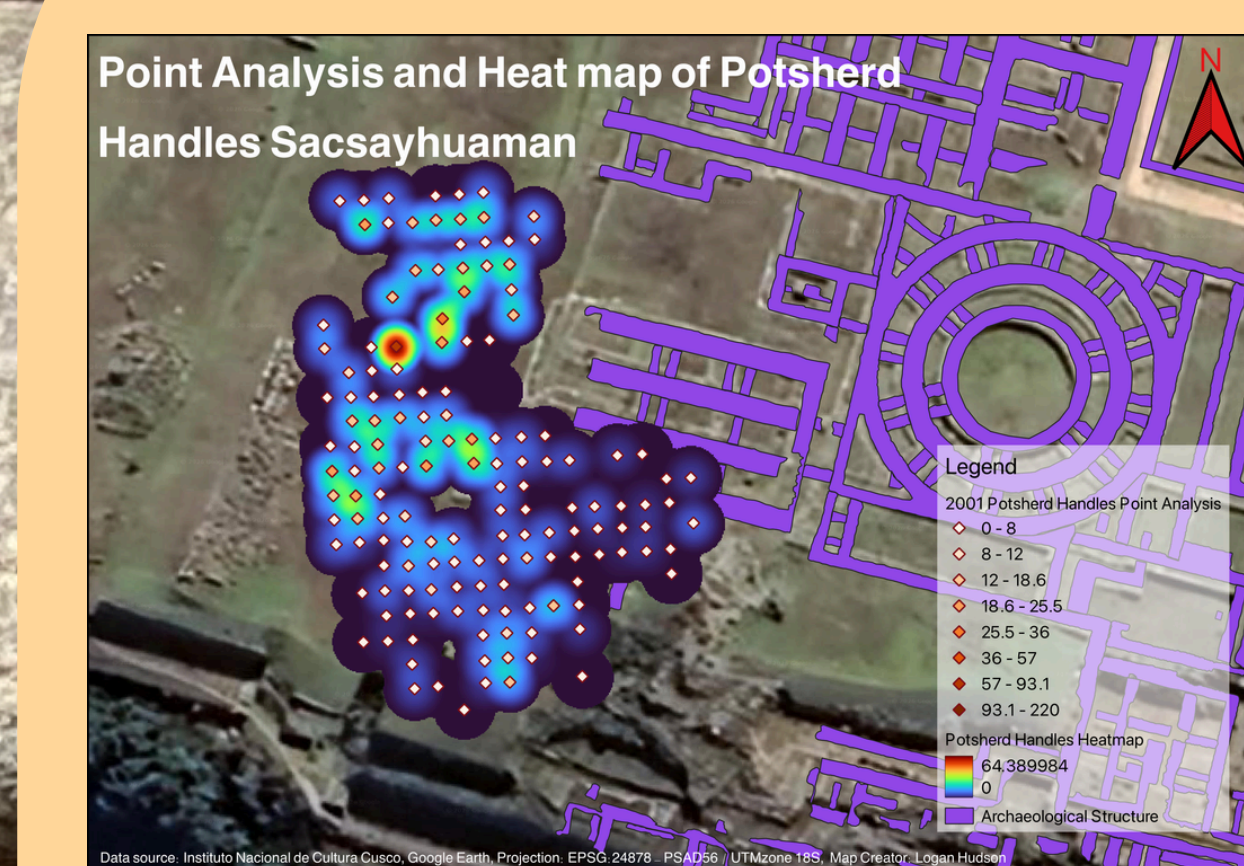


Figure 4

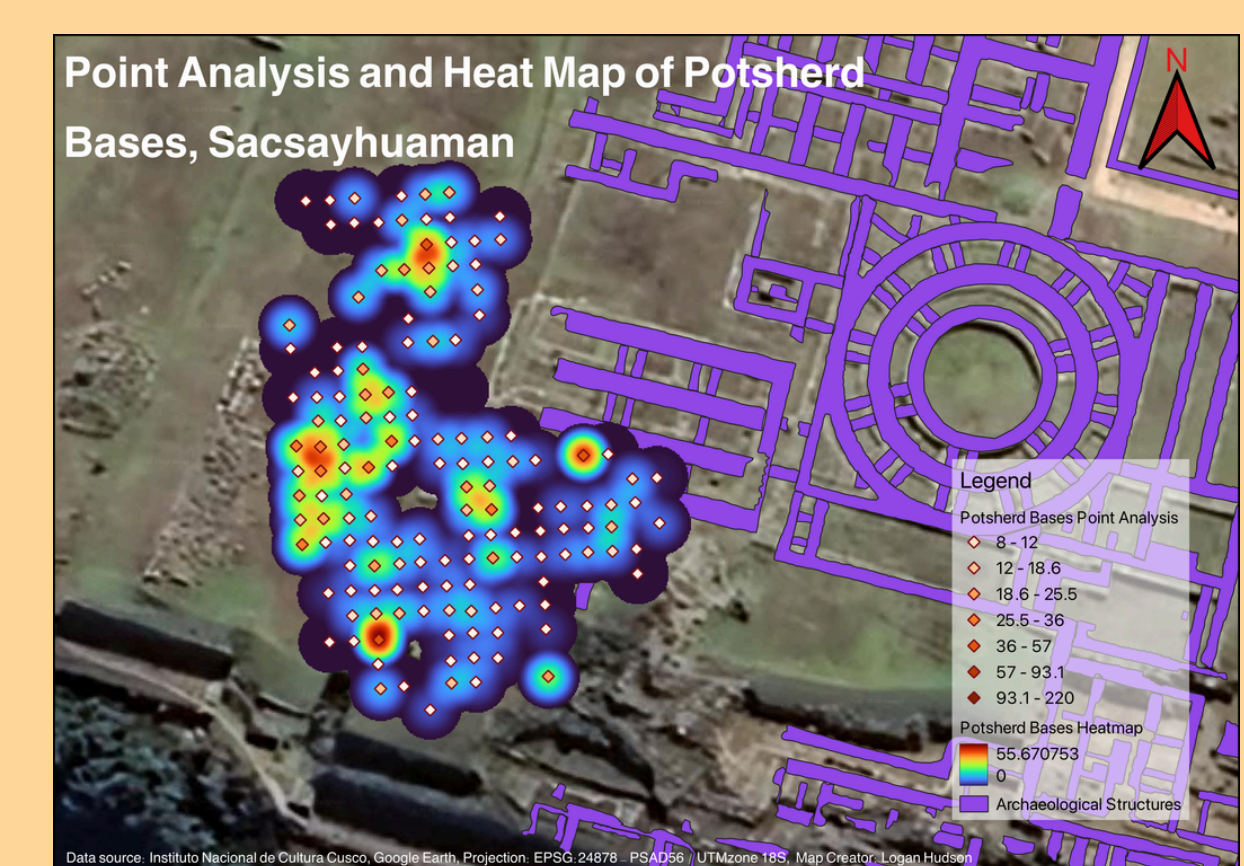


Figure 5

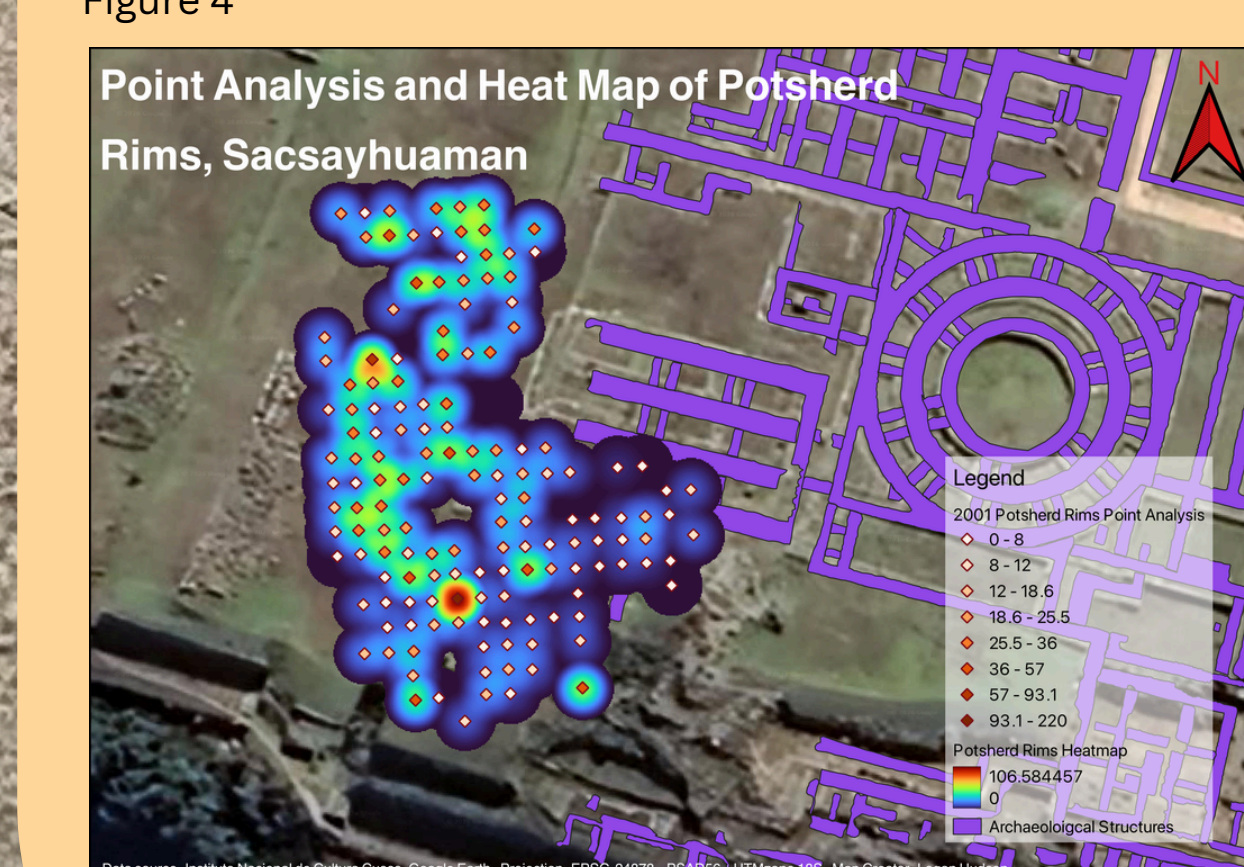


Figure 6

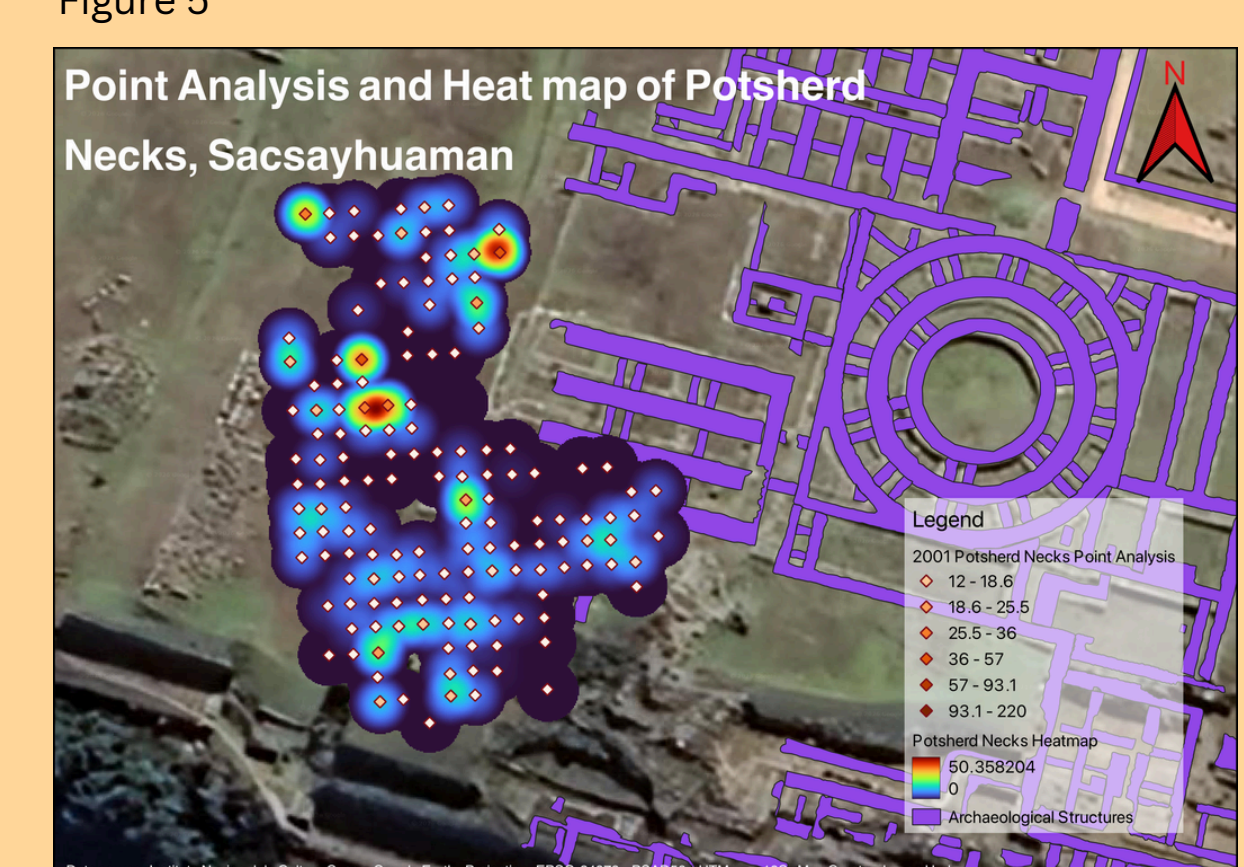


Figure 7

## Acknowledgments

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