

# ADVANCED GEOSPATIAL TECHNIQUES AND ARCHAEOLOGICAL METHODS TO INVESTIGATE HISTORICAL RICE CULTIVATION AT WORMSLOE HISTORIC SITE

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Despite much of the environmental history of Wormsloe State Historic Site on the Isle of Hope, Georgia having previously been documented and described, there are still some aspects that require deeper investigation. For example, whether rice cultivation was ever performed at Wormsloe is a question which does not have a definitive answer. The primary goal of this study, therefore, is the investigation of the Isle of Hope landscape through remote sensing techniques such as terrestrial laser scanning (TLS) and unmanned aerial systems (UAS) to identify archaeological evidence related to historical rice cultivation. Terrestrial laser scanning will be employed to create an accurate and high resolution 3D bare earth digital elevation model (DEM) of the areas under investigation in order to analyze present-day microtopographic features that may be indicative of old rice fields such as ditches, dikes, and embankments. Furthermore, the use of UASs will provide a detailed aerial view of the study areas that can be used to generate a geovisualization of the historical topography and landscape potentially present during the late 18th century and throughout the 19th century. The collection of multiple images of the terrain from different angles will allow the employment of an emerging technique in photogrammetry known as Structure from Motion (SfM) to create 3D models of the areas under investigation. This study also employs archaeological methods such as phytolith analysis to determine the presence of rice plant deposits in the areas where historical rice cultivation is suggested. The results of this study will improve the current understanding of Wormsloe's historical land use and development, as well as its archaeological and historical significance.

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