Abstract

Annual fieldwork at the Bethsaida, Israel archaeological excavation project yields an unwieldy amount of data that have historically been processed and managed via paper-based means and have no associated spatial data. There has been little adoption of modern technology applications to manage this data, even in recent years. The programming objective of this project involved designing and implementing an intra-site, archaeological specific, spatial database for collecting and managing excavation artifacts. A project-based approach was taken toward improved digital data management, tracking, mapping, and visualization in the examination of temporal and spatial archaeological data, thus facilitating the ability for archaeologists to gain new and otherwise undetected insights through spatial pattern analysis. Legacy data, along with data collected via a handheld Global Position System (GPS) device in 2015, aided in establishing the dataset parameters, feature classes, attributes, and domains of the database. This excavation site offered a unique opportunity to explore the space-time continuum through numerous human settlements evidenced by the vertical archaeological record representing the 10th century before Common Era (BCE) through the 1st century Common Era (CE). Visualization of the distribution, concentrations, and spatial relationships of material culture to settlement groups potentially illustrates social trends and cultural practices over the centuries. Data recording will become more consistent and efficient through structured, predefined categories and attributes, bringing greater organization via ontological and semantical consistency. Field collection will be further streamlined and enhanced by the adoption of handheld devices working congruently as an extension of the new geodatabase, collecting artifact information and spatial data, including stratification, in real time. Ongoing research and global collaborative opportunities become possible with the geodatabase, and greater cohesion amongst the diverse excavation team is

enhanced. Archaeologists are further able to forecast areas for future excavation based on the

visualizations.