Establishing a GIS Database for Sedgwick County Archaeology

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Abstract. This multifaceted project primarily concerns the establishment of a Geographical Information System (GIS) database for the archaeology of Sedgwick County, Kansas. The database documents archaeological sites and surveys conducted in the county by the WSU City Archaeologist program and other entities. Documentation has been accomplished using ArcGIS software by ESRI and a digitizing tablet. This spatially locates the known sites and previously conducted surveys and includes the accompanying attributes of each of them. The final product is an electronic record keeping system for the WSU Wichita City Archaeologist Office. The paper records maintained for the past three decades had acquired many errors. The WSU and Kansas State Historical Society records have been coordinated and corrected. Inclusion of soil and vegetation type data provides the foundation for future growth of modeling prehistoric site distribution and findings are already showing promise. Modeling will allow professors, university students, and city, county, and state planners to study impact on finite cultural resources. The GIS project can function as a resource allocation tool. Limited survey and investigation capacity can be efficiently distributed toward the effort of cultural resource management. The project has an unlimited lifespan. Records are now easily maintained and updated. Inter-office data transfer can be performed electronically and with high accuracy. Adapting to advancing technology has been facilitated with conversion to digital files.

1. Introduction.

The time and opportunity to bring the archaeology of Sedgwick County, Kansas into the realm of the technical capacity of the current century has arrived. This project concerns the establishment of a GIS database for Sedgwick County, Kansas. The database documents archaeological sites and surveys conducted in the county. Documentation has been accomplished through creation of computer files spatially locating the known archaeological sites and previously conducted archaeological surveys, as well as the accompanying attributes of each of them.

2. Discussion.

Many benefits are realized from completion of the project and the prerequisite tasks required to establish the GIS database. Immediately, the first benefit realized from the project is the creation of a system for electronic record keeping of sites and surveys for the Wichita City Archaeology Office. Beyond this, the second, and perhaps most important, cutting edge benefit of the project is the foundation of a base for future expansion into the arena of statistical research and the subsequent predictive modeling of archaeological site distribution for effective cultural resource management. Modeling allows university students and professors, and city, county, and state planners to study impact on finite cultural resources. Additionally, the evolving model will be available to utilize as a resource allocation tool to efficiently distribute and apply limited survey and investigation capabilities to the effort of protecting the aforementioned cultural resources.

The project required review and processing of paper files and maps from the Wichita City Archaeologist Office, and printouts, maps, and data from the Kansas State Historical Society in Topeka, Kansas. These documents and files contain site and survey forms and reports, as well as the paper and electronic maps used to spatially locate and record the sites and surveys. High level accuracy has been ensured through coordination and correction of the Wichita City Archaeologist Office files and the data files of the Archaeological Data Manager of the Kansas State Historical Society. Over time, many different people holding differing levels of skill sets have, with good intention, created records and numbering schemes utilized in recording and tracking site investigations and surveys conducted.

Disparities in records between the two entities occasionally surfaced, creating confusion and uncertainty. Records for Sedgwick County in both offices have been reviewed, corrected, and brought into congruent compatibility.

Project data was entered and processed with ArcGIS software by ESRI. Digitizing sites and surveys has been conducted using a digitizing tablet and puck. Spatial location accuracy was ensured by standardizing all conflicting data projections into the projection of NAD 83, zone 14N, which is the projection designated overall for this effort. Provision of data for the subsequent modeling process has been included in this project. GAP vegetation type data was obtained from the Kansas Biological Survey. Soil type data was obtained from the SSURGO database of the United States Department of Agriculture.

A summary report will be generated indicating soil and vegetation types upon which archaeological sites are situated. This is the first step in furthering the goal of predictive modeling. The summary report will contain detailed steps of the procedures and processes of the project. Statements for the requisite accompanying metadata will also be provided in the summary content. This will include sources for data, projections used, and dates of work performed. Included will be steps taken to reconcile data discrepancies, and the rationale for decisions.. Details of equipment utilized and software versions and restrictions will appear in the report. Data update and database maintenance instructions will be provided.

3. Conclusion.

As indicated, the project has resulted, and will result in, several final products. Shapefiles for sites and surveys have been created. Files and records were updated and corrected for both the WSU Wichita City Archaeology Office and the Kansas State Historical Society. Written documentation of the process, problems, and solutions incurred during the project is being produced. File backup systems will be described.

Potentially, the entire project has an unlimited lifespan and future. The digital files have the capacity to be easily maintained and updated over time providing an ever evolving electronic map and data source for multiple entities. The foundation of Sedgwick County archaeological predictive modeling has been established. This will facilitate future resource allocation within the environment of cultural resource management. The project will also provide a valuable tool for research conducted by professors and future students of Wichita State University. Future inter-office data discrepancies will be more easily avoided. When technology inevitably becomes increasingly sophisticated, modeling evolution, data updates, and data transfer and translation will be made much easier with existence of the digital products which result from this very worthwhile project. Wichita State University Anthropology is on the map.

4. Acknowledgements.