Creating a GIS Database for Pre-Contact Archaeological Sites in the Red Cedar River Valley

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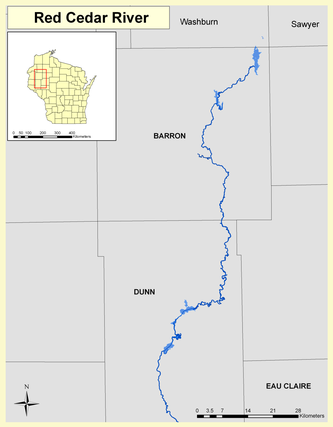
Abstract

The Red Cedar River is located in western Wisconsin, flowing southward from its headwaters in Sawyer County through Washburn, Barron, and Dunn Counties until joining the Chippewa River near Dunnville. For the past 125 years, considerable archaeological research has been conducted along the Red Cedar River and its tributaries. The purpose of this project was to create a geographic information system (GIS) database in order to consolidate this archaeological data into a uniform format. GIS allows for the analysis of relationships between site location and environmental variables (e.g. hydrology and plant communities). A total of 278 sites, ranging in age from Paleo-Indian (~12,000 yrs BP) to Proto-Historic, have been digitized into this database. Future research will be greatly facilitated by the spatial analysis capabilities provided by this project.

Introduction

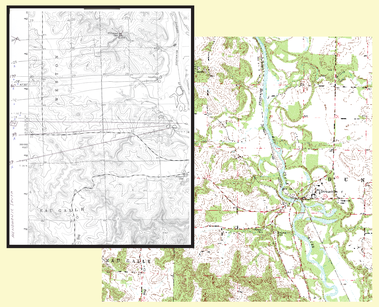
The goal of archaeology is to reconstruct and explain past cultures. Crucial to this process is understanding spatial relationships between past humans and various components of their environments. For the past 125 years, archaeological research has been conducted along the Red Cedar River and its tributaries.

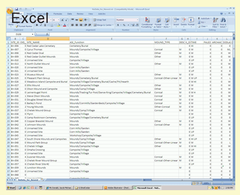


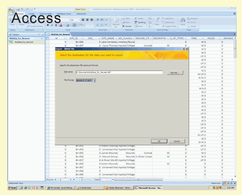
Despite the amount of research conducted, the culture history of this area is still poorly understood because the accumulated data were never synthesized in a manner that allowed spatial relationships to be easily examined. The objective of this project was to create a Geographic Information Systems (GIS) database to facilitate investigation of the distribution of pre-contact American Indian sites. GIS is a georeferenced database that allows for the storing, analysis and management of data and its associated attributes. GIS is becoming an essential tool for archaeologists, because of its ability to analyze and present spatial information. Formerly, such analysis was conducted by working with a series of individual maps, trying to make connections from one map to another. This GIS database will enable researchers to quickly explore relationships between sites and between sites and environmental variables, something that has formerly been impossible.

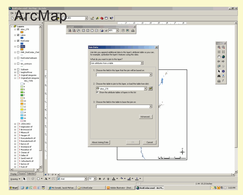
Methods

Site data were compiled from surveys conducted by Dr. Barth and from the Archaeological Site Inventory which is housed at the Wisconsin Historical Society in Madison. Site locations were digitized from paper maps onto digital raster graphics (DRG) using ArcMap. A DRG is a digital version of a topographic map georeferenced in this case by the Department of Natural Resources of Wisconsin.



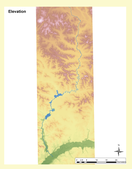




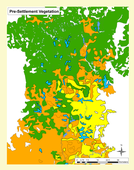


Site information was entered into Microsoft Excel and was later converted into a format that could be joined with the georeferenced sites in ArcMap.

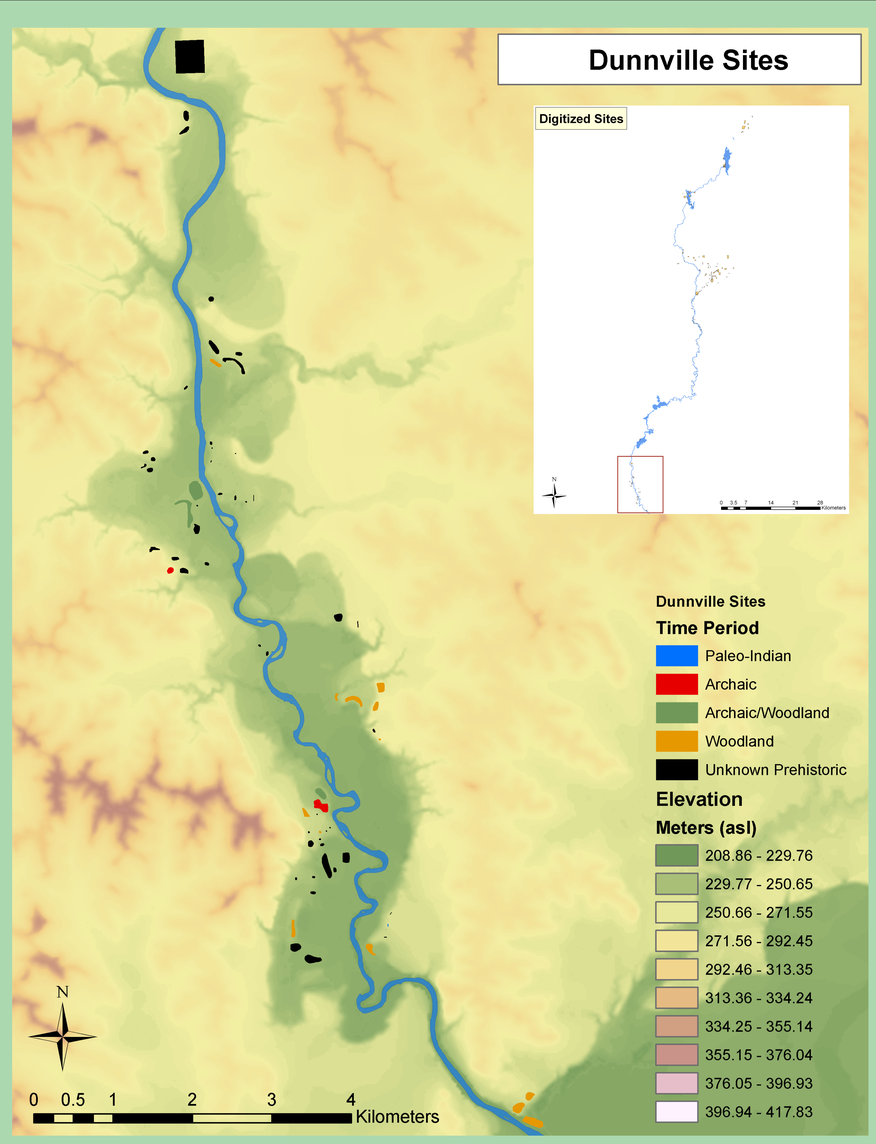
Once site information was joined with site location, environmental attributes were extrapolated from environmental layers, such as elevation, distance from water, and associated pre-settlement vegetation.



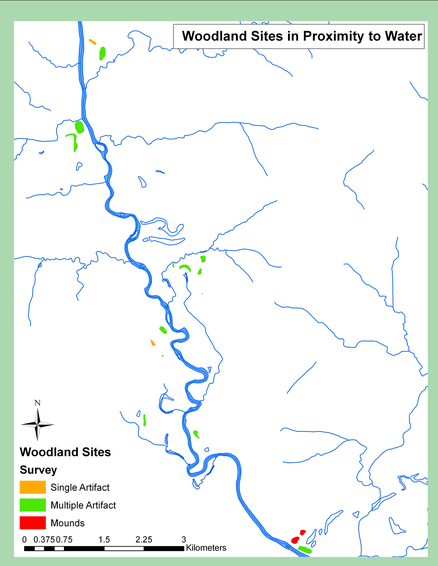
USGS data



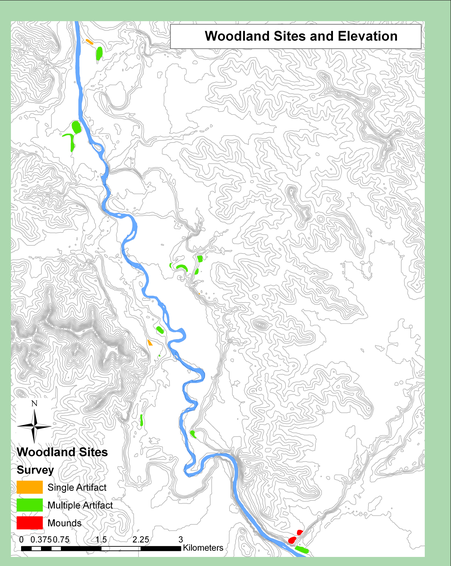
Wisconsin DNR data



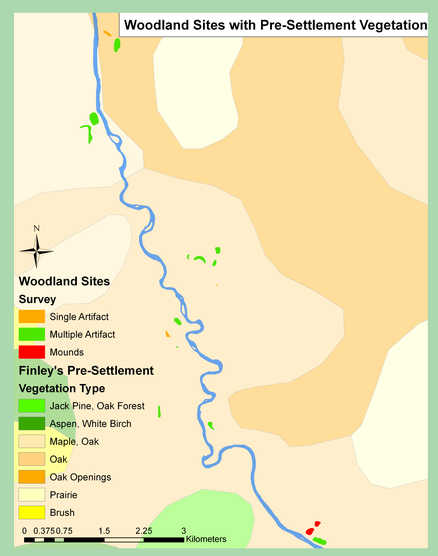
This map shows a portion of the Red Cedar River near Dunnsville. This area has a high concentration of Woodland (>1000 BC) sites as well as Paleo-Indian (~12000 - 8500 BC) and Archaic (8500 - 1000 BC). A digital elevation model (DEM) was used to model the elevation. The sites in black are sites that have no time period attributed to them. These sites might be areas where more surveys would be helpful.



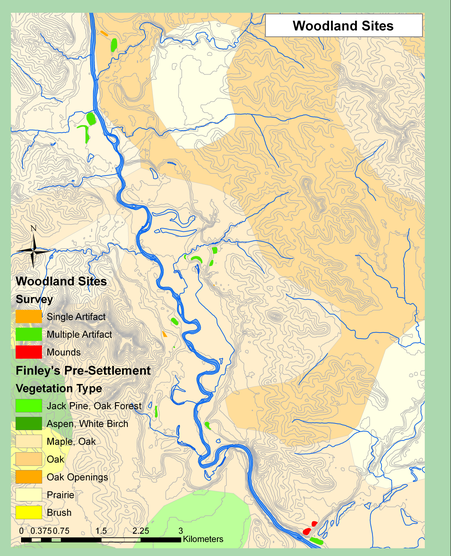
Woodland sites are looked at by the number of artifacts found on the site and their relation to water.



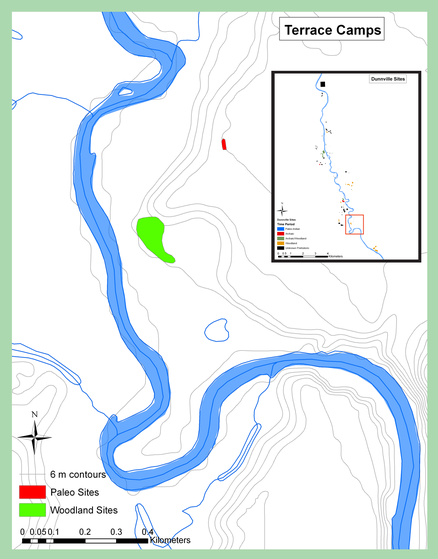
The elevation layer is added to see where sites were located.

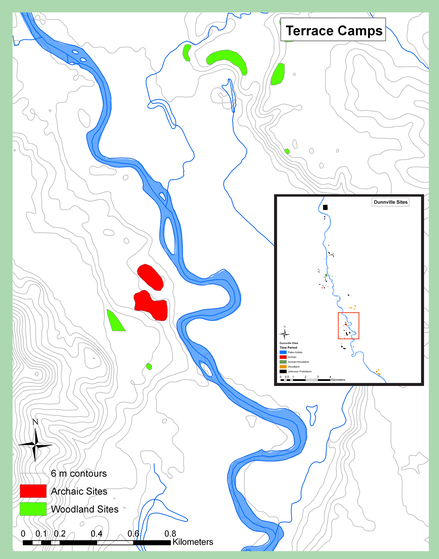


What types of vegetation communities did Woodland peoples perfer? Finley's Pre-Settlement vegetation map might help.

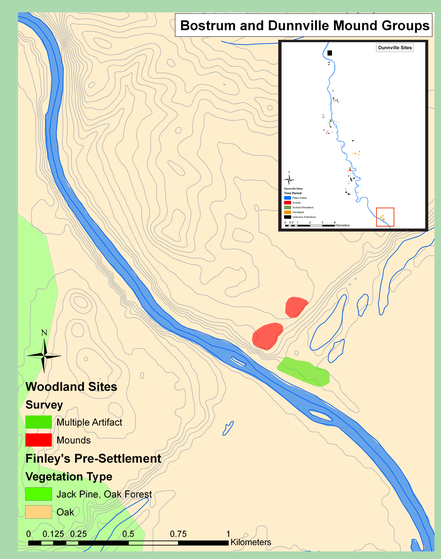


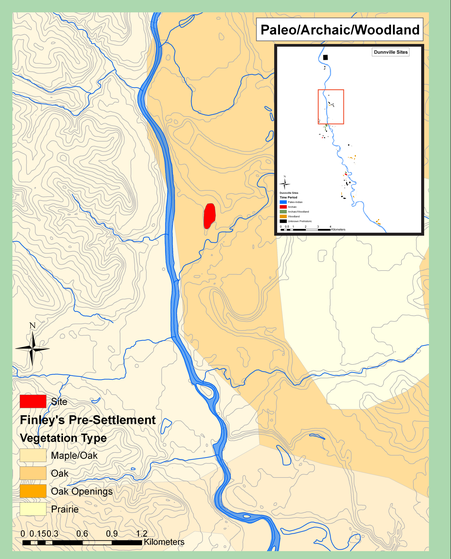
GIS allows any layer and all layers to be added at the same time. This map combines the last three into one.





These maps show sites that may help tell the geomorphic history of the Red Cedar River. The map to the left shows a Paleo Indian site on a high terrace and a Woodland Site on a lower terrace. A terrace is basically an old floodplain of a river that is abandoned as the river downgrades through the valley floor. The fact that a Paleo Indian site dating possibly to 12000 BC means that this terrace is at least this old. The map on the right on the other hand shows Archaic sites on a lower terrace than the later Woodland site. This is still interesting and a minimum age of >1000 BC can still be attributed to this terrace.





The above maps are zoomed in on two interesting areas. The map on the left is of the Bostrum and Dunnville Mound groups. The mounds are located on a high prominent elevation above the associated village area. Mound groups often marked areas of gathering where people would meet during the months when there was enough food to go around. The map on the right is a curious site. There are artifacts from Paleo-Indian all the way up to Woodland at this site. What makes this area so hospitable? Why is there no evidence of multiple habitations at the other Paleo-Indian sites?

Summary

- An archaeological GIS was created for the Red Cedar River
- A total of 278 sites were digitized and described
- Information for each site included: time period, inferred function, and description of finds
- Environmental data included: elevation, pre-settlement vegetation, and hydrology

References

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Acknowledgements

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