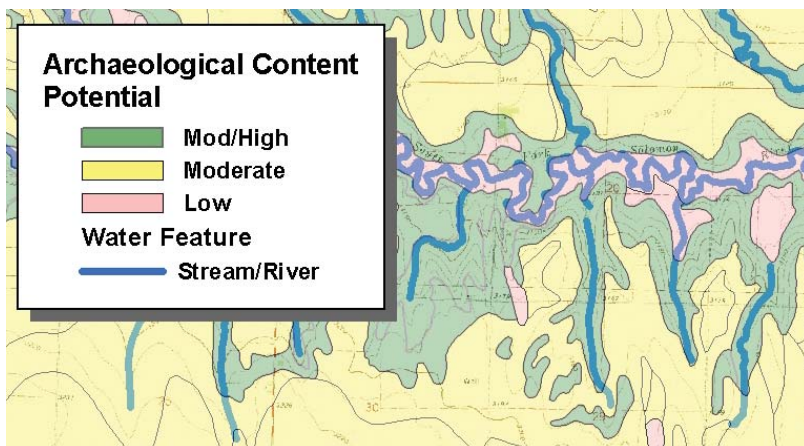


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Cultural Resource Modeling Facilitates Cost-Effective Project Planning

Energy developers know that the potential for cultural resources is one of many constraints to be addressed during project development. For certain types of projects, a tool called predictive modeling can make project development more cost-effective by reducing design iterations and streamlining cultural resources compliance.

A cultural resources investigation typically starts with a review of files at the State Historic Preservation Office (SHPO). The results of the file review are compiled into maps and reports that summarize previously recorded historic and archaeological sites and show which portions of the project area have already been surveyed for cultural resources. The question for cultural resource investigators at this phase is, "How do we handle areas within the project boundary that have not been surveyed?" Predictive modeling can help answer the question by revealing where there is the highest potential for unrecorded sites that could impact the project.



On one recent 50-mi² wind energy project, predictive modeling helped to minimize field work and expedite compliance by defining high-probability areas that were largely avoided during design.

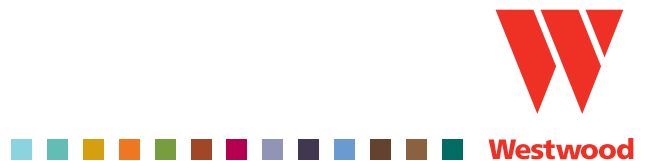
Just as homeowners today find some places more desirable than others, historic people preferred certain locations. Their preferences tended to involve particular landscape features, such as proximity to permanent water sources. The probability of finding archaeological evidence also depends on aspects of the landscape; different soils, for example, have different affinities for artifacts. A predictive model uses Geographic Information Systems (GIS) to analyze water, soil, vegetation, and other factors. The results of this analysis help archaeologists determine if and where buried archaeological deposits are likely to be found in the project area.

While predictive modeling is greatly enhanced by GIS technology, the output of the analysis is not a simple formula. The effectiveness of predictive modeling depends on the expertise and insight of the cultural resource professionals who interpret the results. The factors that promoted human occupation of a site varied both regionally and seasonally. A level area of grassland in the high plains may have served people well in the summer, for example, but a winter camp might have been more appropriate in a gallery forest next to a river.

Predictive modeling is better suited to some types of projects than others. Large project areas will benefit substantially, because the results of the model can be used to limit the amount of field work needed to assess unsurveyed areas. Predictive models can also help compliance at the state and federal levels. Some SHPOs have specific requirements for geologic deposits; Iowa, for example, requires that projects proposed for construction on portions of the DeForest Geologic Formation must conduct sufficiently in-depth archaeological investigations to ensure that older, more deeply buried archaeological deposits will not be impacted by the proposed project. Projects with certain types of federal funding need to comply with Section 106 of the National Historic Preservation Act and other laws (see previous TOPICs).

Predictive modeling of cultural resources, if integrated with other early environmental review work, provides energy developers an opportunity to achieve more efficient project design. Knowing where the potential for cultural resources is low, moderate, or high can limit the number of design modifications later in the project, save money on field investigations, and reduce time and effort needed for state and federal compliance.

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For more information, please contact
Dean Sather
Cultural Resources Principal Investigator
dean.sather@westwoodps.com
952-906-7488