



Evaluation of Archaeological Predictive Modeling on DoD Installations

Project
01-167

Background:

The Department of Defense (DoD) has a compelling need to know where archaeological sites are likely to be located on military installations so that there is maximum access to land for mission requirements. For over 20 years, DoD has funded research into predictive models of site location for large installations. Although a variety of such models exist, none have been adequately tested. Their accuracy, therefore, has always been suspect, and DoD managers and State Historic Preservation Offices (SHPO) have been reluctant to use them in lieu of on-the-ground, complete survey and excavation projects. Consequently, all installations with predictive models have sponsored many archaeological surveys to comply with Section 106 of the National Historic Preservation Act. As such, no model has met the promise of increasing resource management capabilities or decreasing costs associated with legal compliance.

Objective:

The project objective was to answer four specific questions:

1. Do the predictive models created by the military work?
2. Can they be refined to work better?
3. Are they sufficiently accurate so that land managers and SHPOs can use them to evaluate management decisions about installation cultural resources?
4. Can a predictive model be integrated into a more dynamic operational model useful across DoD to increase cost efficiency of cultural resources management at large installations?

In order to accomplish this objective, the project evaluated predictive models from installations across DoD to determine which ones work and how to ensure they met their management promise.

Summary of Approach:

The project involved three steps:

1. Determine the pervasiveness of archaeological predictive modeling in the military through a questionnaire sent to DoD installations.
2. Choose models from four of the responding installations for an in-depth evaluation of their technical quality, accuracy, and general utility as a management tool, with suggestions on how to improve the utility of each model.
3. Take the results of the evaluation and design a follow-up study that could directly contribute to more effective use of archaeological predictive modeling by military installations.

Benefit:

This project benefits DoD by determining which predictive models have been successful and how they can be used to more efficiently and effectively manage limited cultural resources funds in the future. The results of this analysis may save DoD time and money by providing successful models for eliminating costly inventory and mitigation projects that are not necessary.

Accomplishments:

Based upon the project objective, models from four installations were evaluated to test their predictive success. Each model was found to be reasonably successful at predicting site locations, but recommendations were made to improve their predictive success and management utility. The study identified recurring themes:

1. DoD lacks a standard mechanism for sharing information and assistance among installations.
2. Few models are based on multivariate statistical techniques or theoretically based constructs.
3. Geomorphology is not a component of most models.
4. Most models do not use remote sensing techniques.
5. Models are treated as final products rather than a process involving continual modification and improvement.
6. Models are not integral to the compliance process. Decisions regarding level of inventory, eligibility determinations, and resolution of adverse effects rarely include model predictions.

The project conclusions, presented in the report "Predictive Modeling in the Military: Similar Goals, Divergent Paths," were used to develop a workshop (held in August 2004) for DoD cultural resources managers. The goal of the workshop was to identify and create products or tools that assist installations in developing models, improving existing models, or using models to more effectively manage resources, improve stewardship, and facilitate compliance. See the factsheet for **Project 03-167** for more information.

Contact Information:

Mr. Martyn D. Tagg
Cultural Resources Manager
Headquarters, Air Force Materiel Command
4225 Logistics Avenue
Wright-Patterson AFB, OH 45433-5747
(937) 656-1281 Fax: (937) 257-5875
martyn.tagg@wpafb.af.mil

This factsheet and the full project report are available online:
<https://www.denix.osd.mil/denix/Public/Library/NCR/archaeology.html>