Preservation and Rescue

Challenges and Controversies in the Protection of Archaeological Resources

Thomas F. King

OCS Prehistoric Site-Discovery Difficulties

In the last several years, the Department of the Interior has sponsored several broad predictive studies of the Outer Continental Shelf to identify areas where prehistoric sites and historical shipwrecks might occur. The essential management purpose of these studies is to guide decisionmaking about issuance of oil and gas leases, and about the need for site-specific surveys in advance of oil and gas well drilling, pipelaying, and other activities affecting the ocean bottom on the Shelf.

In the following article, Leland W. Patterson of Tenneco, Inc., argues a position held by many oil and gas company officials—that prehistoric archeological studies on the Shelf are not cost-effective. Patterson is Tenneco’s Manager of Environmental Affairs Engineering.

I sent the article to E.G. Stickle and Michael Roberts, both archeologists with considerable experience in studies of the Shelf, and their responses are appended to Patterson’s paper.

T.F.K.

Introduction

It has been understood for some time that there has been considerable coastal subsidence since the end of the Pleistocene period, caused by rising sea levels from glacial melt in the early portion of the Holocene. There is, therefore, a good possibility that submerged prehistoric archeological sites of the Paleoindian and Early Archaic time periods exist on the Outer Continental Shelf (OCS). Gagliano et al. state that the best possibility of drowned prehistoric sites on the Gulf Coast cover a period of 55,000 to 3,500 years before present.

There has been interest in recent years in the possible discovery of prehistoric underwater sites off the coasts of North America. An entire symposium was devoted to historical and prehistoric archeology of the OCS at the 1980 annual meeting of the Society for American Archeology. Work to-date was described for the East, West and Gulf coasts. Investigators noted that no prehistoric sites have yet been located on the OCS. Only a few prehistoric remains have been found in more shallow waters on the coastal margins, compared to on-shore site densities. The OCS is generally defined as being beyond the 3-mile limit from the shoreline, out to a 200-meter water depth.

Funding for research on OCS prehistoric archeology is mainly by the petroleum industry and government agencies, such as the BLM and the Interagency Archeological Services. The question to be raised by this article is whether or not there are any potential benefits to the consumer, taxpayer, and the public domain in general from expenditures for research on prehistoric underwater archeology on the OCS. A judgment on this may be made based on the probability of finding significant numbers of sites. If the probability is low, as it appears to be, the value of much further research in this area can be questioned. With strict limitations in governmental funding for overall archeological research, any research area with a low potential for results should be questioned. Limited funds should be employed for projects with a high potential for significant results. King has previously questioned the cost effectiveness of current work in contract archeology in general.

The value of expenditures for contract archeology related to prehistoric underwater sites by private companies engaged in OCS oil and gas exploration and production should also be questioned, as the general consumer ultimately pays for this work. Archeology in general can suffer from a public
credibility gap when significant expenditures are dictated by environmental regulations for work where few tangible results can be shown.

OCS Underwater Site Detection

Unlike dry-land archeology, where extensive surface surveys can be made, the detection of underwater sites on the OCS must be done exclusively by indirect detection methods. The OCS sea bottom is not only generally in considerable water depths, but is also usually covered with several feet of mud. As water depths increase, even scuba-diving operations become more difficult because of considerations involving diver safety and decompression schedule.

Early prehistoric sites on the submerged coastal plain are likely to be small concentrations of lithic materials, and perhaps some concentrations of remains of utilized shellfish, although there is little present evidence for major shellfish use during the Paleoindian and Early Archaic periods. None of the instrumentation currently used for underwater surveys is capable of detecting this type of site. This equipment includes the magnetometer, side-scan sonar, and various types of seismic subsurface profile equipment. To compound the difficulties in detection of prehistoric underwater sites, early sites are known to occur at low densities per unit area, probably because of low population densities.

Current development of the OCS for oil and gas uses available techniques for surveys of the sea floor. The present strategy is simply to detect and avoid significant surface and subsurface anomalies of any type. This strategy automatically protects detectable cultural resources. There is then no need for further investigation of the nature of anomalies, which are mainly of historic or natural nature, including possible shipwrecks.

Since there is no instrumentation currently available that is capable of detecting prehistoric underwater sites on the OCS, the only other possible strategy is the use of physical sampling such as core sampling. Core sampling, however, is not a generally proven technique to locate prehistoric archaeological sites even on dry land because, even on a fine grid, core sampling obtains a very small sample of the total sample area. For example, 3-inch-diameter cores at 100-foot grid spacing over 1 square mile would sample only 142 square feet out of a total sample area of 27.9 million square feet. This is a negligible sample size. Selection of special geological features for core sampling might increase the probability of locating prehistoric sites, but the relative sample size would still remain rather small. Core samples of the same size on a relatively tight 50-foot grid for an area 200 by 200 feet would sample only 0.003% of the total area.

Another discouraging aspect of finding prehistoric sites on the OCS is that even if a site were located under several feet of mud, there may not be a good technique for then obtaining a satisfactory overall sample of materials on the site, because of physical and cost considerations. For example, the underwater portion of the well known St. Albans, West Virginia, site has not been fully explored because of a lack of available funds.

Summary

This article has noted that there could be underwater early prehistoric sites on the OCS. At the present time, however, there are no reliable techniques to locate these sites. Because of the extreme difficulties in locating underwater prehistoric sites on the OCS, the value of any significant level of expenditures on research in this area should be questioned. Future environmental regulations should certainly not require any expenditures for the location of underwater prehistoric sites until reliable and cost-effective detection methods are available.

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Comment I

I strongly disagree with Patterson’s statements and conclusions.

First, whereas it’s true that side-scan sonar, magnetometer, and sub-bottom profiling cannot locate prehistoric sites on the OCS (in my opinion), it’s not true that there are no cost-effective methods that can be used. The RCV remote controlled television unit is remarkably mobile and you can clearly see the sea floor with enough detail (it has a search light on it too for darker areas). It has a fantastic depth capability of 2,000 m., beyond what is needed for OCS work. I used that system last summer on an underwater survey in the Santa Barbara Channel, and I know it can work.

Secondly, the ‘‘cost-effectiveness’’ idea is irrelevant since the oil-gas companies have to use those remote sensing systems anyway to fulfill government requirements for ‘‘Bottom Hazard Surveys.’’ So why not have a qualified underwater archaeologist also review the data? They certainly don’t charge as much as consulting geologists, one of whom I know charges $600/day.

Patterson’s arguments are—we don’t have the technology—it’s too costly to use what we’re using, so forget OCS archeology. These can be countered by using appropriate technology (e.g., remote TV) and reviewing the other remote-sensing data which the oil-gas companies have to conduct anyway.
The loss of one early OCS human site, through irresponsibility, would be a great loss to our cultural heritage.

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Comment II

Patterson’s paper makes some extremely banal and destructive arguments against the continuation of offshore exploration for prehistoric archaeological sites. Given the current political climate in the nation, it is possible that these arguments will prevail unless a case can be made against them. I will attempt in this comment to put his arguments in perspective. The points in this discussion will, in large part, be based on the research data and resulting recommendations to be found in the report of the Institute for Conservation Archaeology (Peabody Museum, Harvard University) prepared for the Bureau of Land Management and entitled: Summary and Analysis of Cultural Resource Information on the Continental Shelf from the Bay of Fundy to Cape Hatteras, soon available through the National Technical Information Service.

The question Patterson proposes to open by his article, “...is whether or not there are any potential benefits to the consumer, taxpayer, and the public domain in general from expenditures for research on prehistoric underwater archaeology on the O.C.S. (Outer Continental Shelf)” (my emphasis added).

His judgment on this matter is based on the probability of finding “significant numbers” (emphasis added) of sites. Herein lies the first fatal flaw of Patterson’s arguments. It is not clear to me (or, I expect, to most researchers and cultural resource managers) that “numbers” of sites is as important as “significance” of a site. The location and examination of a Paleo-Indian site preserved by the transgressional sand sheet and accompanying anaerobic environment which might allow for the preservation of an as-yet-unprecedented variety of ancient materials (leather, wood, skin, etc.) could make Stonehenge look like a pot-hunted bottle dump. The ICA’s study predicts the existence of the full range of such site types. The finding of even one small site would provide valuable data to confirm or reject current thinking on the entire body of present data on the peopling of North America. Question: does this expected single possible site deserve to be ravaged in the same manner as the Etruscan tombs, exploited as Napoleon exploited the Great Pyramid, explored with the exuberance of Belzoni, or left to be destroyed by uninformed exploiters of the valuable resources of the Continental Shelf? I would submit that the expected data are too important and too fragile for such carelessness.

Patterson argues that, “Any research area with a low potential for results should be questioned.” Such a statement, even in a terrestrial context, might be severely questioned (as by Patterson in A.S.C.A. Vol. 7, No. 4), but for the sake of discussion let’s accept it as a valid argument. The problem is that we don’t know what the potential is! We have predicted potentials,1 but no one has tested these predictions. Until we are confident of the validity of our predictions, any argument based on a low probability of site existence is, by definition, faulty.

A similar fallacy lies in the emphasis on (and indeed the concept of) cost-effectiveness in cultural resource studies in general and offshore studies in particular. As an engineer, I used to deal with the cost-benefit ratios of different design approaches. Cost-benefit is another name for cost-effectiveness, and I would argue that the term “cost/social-benefit” is an even more appropriate one for cultural resource managers. This outlook, one hopes, would divorce finding things from the evaluation of a site’s significance. As a state senator once put it to me, ‘‘How much are arrowheads going for nowadays?”

The benefit to society of the data located within a site is of course not measurable. I would submit, however, that a measurable quantity is the cost of complete recovery, analysis, and reporting of the data that may be destroyed by a proposed action. If the cost to society of avoiding damage to a site is less than the cost of data recovery, it would seem the best cost/social-benefit ratio is on the side of avoidance.

The comparison of dollar value to dollar value for data recovery and avoidance seems, at this point, to be the most pragmatic approach to cost/social-benefit analysis. What, you ask, happens to the “significant” data in the site you avoided? In the above examples we have banked the data for the future. There will, I am convinced, be a sufficient number of sites where the most favorable ratio is on the side of data recovery to satisfy the most concerned research archaeologists. On the other hand, the act of locating and evaluating some sites for the purposes of decision-making provides invaluable scientific and anthropological data even if the sites are never fully excavated. The relatively small samples of Catal Hüyük, Tepe Yaya, Galindo, Teotihuacan, the Marlboro Rock Shelter are examples in point. What I am attempting to say is that before appropriate management decisions can be made the decision-makers must know what “significant” data will be lost by a proposed action. But in order to know that, one must find and evaluate the sites that may be affected! Not many wise decisions are made.

on the basis of wishful thinking ("Because we haven't found them, they can't be there and so we don't need to consider them.")

Patterson's concern for the effect on the oil and gas consumer is touching, but actually, if all the money supposedly spent on archaeology (terrestrial and underwater) in 1978 ($200 million, according to King\(^2\)) had been spent exclusively on archaeology associated with oil and gas development on the OCS, the consumer would hardly have felt it. The approximate cost of erecting one offshore production platform on the Midatlantic Outer Shelf, with an average number of gas and oil wells (20–30) is that same $200 million. As an engineer would say, such a sum is merely "in the noise" of the oil and gas industries' annual operations—just petty cash. This is not an argument for low-level wasteful spending, but for placing archaeological costs in perspective.

Patterson's argument for the difficulty of finding sites seems to me also fatally flawed. In the first instance, indirect detection is not the only way an underwater site can be discovered. Cores can be taken, as he points out, at the location of expected sites that will give direct evidence of a site's existence. Gagliano is presently evaluating the "signatures" of prehistoric sites in cores using land examples and obtaining positive results useful underwater. Of course it is the skill of the researcher in directing the placement of tests and in their interpretation that is the key to success. The placement and analysis of small sample fractions is the daily work of archaeologists working in a forested environment, for example, but it doesn't stop them from finding sites.

I must take exception to Patterson's statement that "Early prehistoric sites on the submerged coastal plain are likely to be small, etc., etc., etc." Disregarding the large and dense kill sites that should exist on the fertile coastal plain, and which have analogs in the well-known inland sites of the West, the eastern near-coastal Paleo-Indian sites of Debert and Bullbrook are in themselves quite large, with "hot spots" that might well have been detectable by indirect means (remote sensing) and surely by direct ones such as coring and monitoring construction, if the sites named had lain offshore. As regards shell mounds, one has only to look to Louis Brennan and his large Early Archaic shell mounds well up the Hudson for implications concerning what may be found further downriver (in the Hudson canyon?) or along the paleo-coastline. The problem here is the same one we began this comment with, WE HAVE NOT LOOKED FOR THEM. In Europe, of course, we have known for some time (since at least 1939) of large paleolithic sites on raised beaches in Ireland. On Maine's raised beaches we may expect a similar situation (indeed some of these may already have been found, judging from current research). In other parts of the world researchers are beginning to report (as yet informally) on the locations and contents of submerged prehistoric sites (K.C. Chang, personal communication).

I believe that Patterson's real beef is not our inability to find sites on the OCS, but rather the cost of finding those sites. That argument, as stated earlier, is best left to the cost/social-benefit analysts, not to those responsible for the stewardship of our global heritage. At the same time, his argument against funding research in this area is inappropriate when what is being funded is compliance. Granted there would be a healthy dose of research in a compliance effort (as Patterson has so often reminded us), but the goal of the funding agency (except in a clearly identified research project) is compliance with federal historic preservation law.

Patterson's parting shot, "Future environmental regulations should certainly not require any expenditures for the location of underwater (my emphasis) prehistoric sites, until reliable and cost-effective (see my comment earlier) detection methods are available," is enough to send chills up the spine of even the most insensitive Historic Preservationist. No underwater prehistoric archaeology? What about those in the intertidal zone, near-shore expressions of existing terrestrial sites, or offshore multi-component sites spanning the full range of prehistoric periods? The effects of oil and gas development are not limited to the OCS. Pipelines coming on-shore, coastal storage and refining sites, and harbor dredging are only a few of the sources of impact on near-shore prehistoric sites. These sites are even easier to find than those on the OCS. What a terrible loss to our global heritage if no one had ever considered the valuable resources beyond our shoreline. We must constantly keep in mind that the decisions we make today will be remembered by our children and, if we are not careful, cursed by our grandchildren.

In summary, several points must be emphasized. First, the number of sites may be less important than the discovery of a single site. Indeed, Patterson's "numbers of sites" seem more appropriate to the study of settlement patterns on the OCS (which, given the expected sample size, may never be feasible) than to what is the more likely true value of OCS sites: the validation (or modification) of theoretical models concerning the earliest periods of this continent's habitation and development. As Wobst and others have said, fewer data are required to support well-founded models than to build unfounded models. Such models are in the development stage. Second, no real tests of the offshore potential have been accomplished or even undertaken. Offshore dredgers, clammers, etc., have found evidence of submerged prehistoric sites, but this fact appears not to be sufficient for offshore decision making. It seems appropri-

ate, therefore, to recommend studies that will test the models proposed by professional investigators. The ultimate purpose is to evaluate the models thus far developed within the current state of the art. In no case have tests been made of OCS's cultural resource potential within a management framework. At this date we have not progressed to the testing and thus evaluation of actual potential.

Finally, I feel that Patterson's arguments are potentially destructive to the world's cultural heritage and I have tried to develop some counter-arguments that may inspire other defenders of our underwater resources to become more actively involved in the discussion—at least more involved than indicated by the recent annual meeting of the Council for Underwater Archaeology, where only one paper out of 59 dealt with underwater prehistoric resources.

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Conservation Specialists Needed in Italy

Readers' attention is directed to the following statement from the Director of the International Centre for the Study of the Preservation and the Restoration of Cultural Property (ICCROM). T.F.K.

The tragic earthquake of November, 1980, caused widespread loss of life and damage in Naples and the province of Campania, Italy. Hundreds of historic buildings have been damaged or destroyed and thousands of objects broken. It is too early, however, to assess the full extent of damage to cultural property.

ICCROM, the International Centre for the Study of the Preservation and the Restoration of Cultural Property, is ready to repeat its role of 1966 when it organized international aid to Florence and 1976 when it assisted in the Friuli earthquake.

Conservation specialists from the United States who wish to offer their services should contact Bernard M. Feilden, Director, ICCROM, at 13 via di San Michele, 00153 Rome. At the present time, ICCROM is unable to indicate specific requirements, but will do so as requests are received from the relevant Italian authorities. Specialists, therefore, may wish to provide Dr. Feilden with a resume so that he can immediately evaluate the professional resources at his disposal.

Preservation and Rescue is a regular feature of the JFA and is concerned with challenges and controversies in the protection of archaeological resources. We welcome contributions that discuss the legal, ethical, and professional responsibilities of archaeologists, universities, governmental agencies, and the public towards the world's finite, nonrenewable, and all-too-swiftly disappearing archaeological resources. Contributions to be considered for Preservation and Rescue should be sent to Thomas F. King, Advisory Council on Historic Preservation, 1522 K Street NW, Washington, D.C. 20005.