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JAMES S. DUNBAR
BUREAU OF ARCHAEOLOGICAL RESEARCH
THE CAPITOL
TALLAHASSEE, FLORIDA 32399-0250

LAWRENCE E. ATEN

The Past and Future of OCS Cultural Resources Management

Introduction

It is important, from time to time, to review what we are interested in and to consider where we are going with the submerged archaeology of the outer continental shelf (OCS) rather than to take these matters for granted. Working on the OCS is a fragile opportunity. We must continue to expect that important information and sites exist to be protected on the continental shelf, and we must have minimally adequate techniques to work in that setting, if we are to justify the public policy protections that have been established.

So, for this discussion, and without wasting time revisiting old controversies, Ed Friedman asked me to briefly cast an eye over how far Federal OCS cultural resources activity has come and where it might go in the foreseeable future.

Not many years ago it was common to read that littoral and maritime economies were a Mesolithic and Middle Archaic innovation in human history. As we now know, evidence of coastal economies extends far back into the Paleolithic in the Old World (see Clark 1983:2 for summary), and New World coastal dates are steadily creeping farther back in time, now solidly into the Early Archaic and with some highly suggestive evidence of

Paleoindian coastal activity. Presumably it is a generally accepted proposition that a major part of the record of how man in North America initially colonized uninhabited coasts and responded to the subsequent colossal environmental changes of the late glacial to interglacial transition is to be found on the continental shelf. The cultural adaptations stimulated by all this change had to add up to more than a design shift from fluted points to stemmed points. We should be able to document significant evolution in technological, demographic, and exploitive patterns that in many cases will be unlike those of the early inland habitats we are accustomed to studying.

Stright (1989) has inventoried 35 submerged sites and localities on the Atlantic, Gulf, and Pacific sections of the continental shelf of the United States at which one or more prehistoric archaeological sites were partially or totally inundated by rising sea level. More are being reported all the time. Some are described by papers in this volume. Most are in nearshore and estuarine situations, but some are in deeper water. Garrison's paper herein reports a data base with over 4,000 shipwrecks in the Gulf of Mexico alone, which is a 100% increase from the number identified in the original baseline study conducted 12 years ago (Coastal Environments, Inc. 1977). What is significant about these findings is that there now is a steadily growing inventory of confirmed in situ site survivals. Moreover, the fact that many of the prehistoric sites are shell middens or were incorporated in marsh deposits relatively soon after occupation means we can expect preservation of the numerous classes of data that are typical of wet sites.

And so, today, unlike 15 years ago when our expectations for the significance of submerged resources largely reflected what we thought might be or should be out there, we can document that submerged sites remain preserved on the continental shelf to be found, protected, and studied.

Considerations for Future OCS CRM

Is there a significant enough future for OCS mineral development activities to make concern for offshore cultural resource management (CRM) worthwhile? Over my working lifetime, there have been two major upswings and three major downturns in the oil and gas industry. Each time, people have spoken as if the boom or the bust will go on forever. Of course, neither is true. The industry in its modern history has been strongly cyclic. But even in its current low ebb, there are some very large financial investments being made in offshore technology and installations, and vast unexplored areas and undeveloped prospects remain to be examined.

Currently, in the northern Gulf of Mexico, 85% of known oil and gas reserves occur in water depths over 200 m (i.e., off the continental shelf); this is where the greatest expansion of exploration and production is now occurring. However, although over 26,000 wells have been drilled in the shallow continental shelf since the first offshore platform was constructed in 1947, the great majority of wells are drilled to less than 12,000 ft; deep prospects, in the 15,000 to 30,000 ft range, are essentially unexplored but hold some very promising hydrocarbon structures.

As the economic climate changes, we can expect the resumption of offshore oil and gas activity, and if the past is an guide to the time frequency for such cycles, we should expect this resumption before the year 2000.

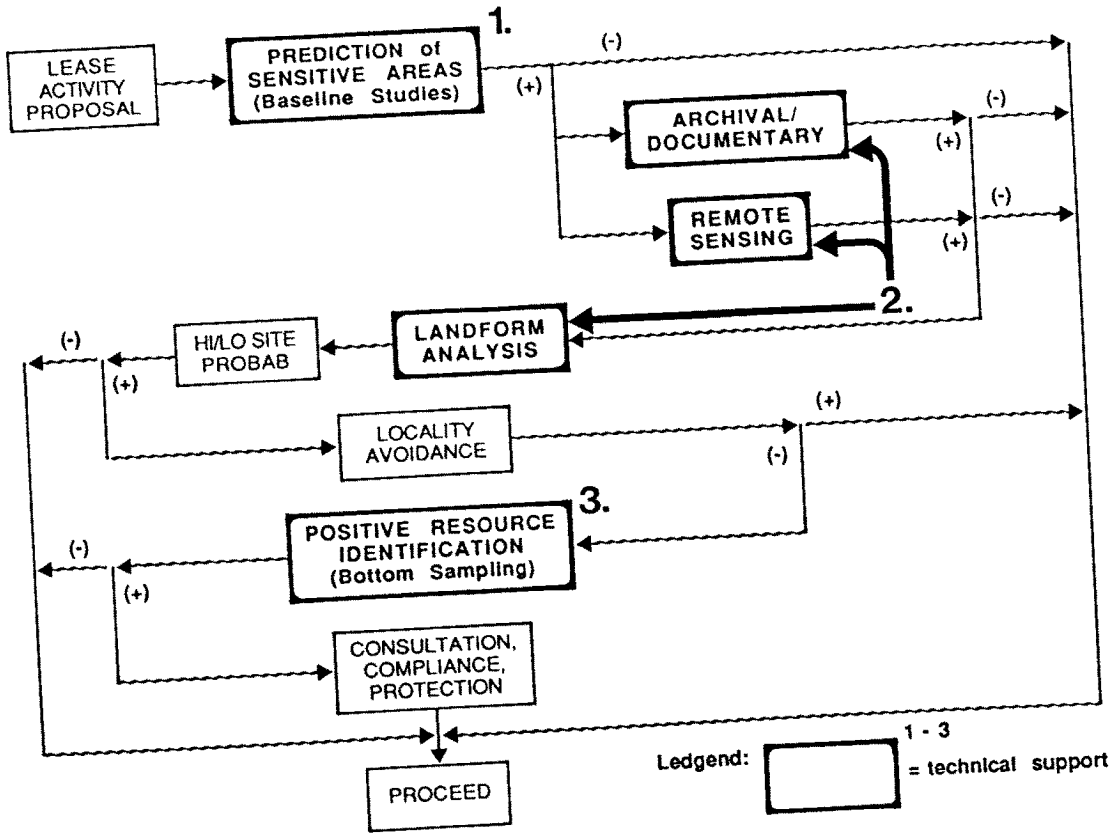

FIGURE 1. Offshore cultural resource protection management system schematic model.

In addition to oil and gas activity, we must consider the potential for other minerals on the continental shelf - in particular, shell, heavy minerals, and sand. A number of assessments of these materials have occurred or are underway as part of evaluating the mineral potential of the Exclusive Economic Zone (EEZ). With the possible exception of sand for beach replenishment projects, none of these resources seems likely to be developed immediately, although all are expected to be produced at some point in the next few decades. Therefore, because of the scale of oil and gas operations and because the anticipated effect of extracting hard minerals will be much like strip mining, we can assume that the need will remain strong in the foreseeable future for developing and refining methods of offshore cultural resource protection.

The OCS CRM System

The Federal management system devised to administer the search for and protection of submerged cultural resources has retained basically the same structure it had when adopted nearly 15 years ago. It is a procedure oriented around avoiding cultural resources rather than focusing on resource identification. As a result, the huge amount of field surveying that has occurred, especially in the Gulf of Mexico, has by itself produced little in the way of positively identified sites. This circumstance, at times, has caused significant political problems in perceptions about the validity of the OCS cultural resource protection program.

The prospect of changing the administrative approach to one of positively identifying every remote sensing anomaly or documented wreck locality seems neither feasible nor desirable. I will make some suggestions later about how to deal with this but for now I believe that this administrative approach is a logical and sound public policy, and that it can be satisfactorily defended if necessary.

There are three basic components to the current management system for the protection of submerged cultural sites (heavy lines on Figure 1; the light lined parts are administrative operations) requiring competent technical operations and these can be reviewed to assess progress that has been made: regional baseline studies; indirect site data collection (archival/remote sensing field studies) and probability assessment; and bottom sampling.

Baseline studies: The early regional baseline studies were conceptually sound and represented the best level of synthesis possible at that time. They have served the OCS program relatively well as the technical framework for decisions triggering implementation of lease stipulations, but we must recognize that they are showing their age. Conspicuous by its absence on Figure 1 is the provision for feedback from data collection and analysis (Technical Components 2 and 3) to the baseline studies. Although this was not a significant problem at the beginning of the OCS cultural resource management program, it now is a concern that there is no institutional means for capturing and capitalizing on the results of both industry surveys and submerged site research in general. For example, the Belknap and Kraft (1981) preservation potential model has been fruitfully tested and site preservation situations identified in the offshore Sabine study, but these findings are not yet incorporated into the general OCS management process for that area. It is essential that planning be done to create a means for achieving this feedback.

Indirect data collection: I am not really qualified to evaluate the adequacy of technical requirements for deploying side scan, subbottom, and magnetometer remote sensing. My impression is that there is relatively little discussion of this just now, only because the level of lease block survey is so diminished. The currently available remote sensing technology is capable of delivering satisfactory results if applied properly. Although it is not practical to expect high resolution coverage of all leases, it is justifiable in specific instances when our expectations are high. This obviously points back in the direction of updating the baseline studies to create more refined site probability maps. I suggest that the fundamental answer to achieving sufficiently intensive surveys is not in arguing about line spacing and so on, but in refining the baseline studies and the site probability maps.

I know that quality control of survey records provided by lessees is sometimes still a problem, but that is an operational matter for the Minerals Management Service (MMS) to deal with. Also, the interpretation of remote sensing data into recognition of magnetic anomalies and into a coherent late glacial to Holocene paleogeographic reconstruction sometimes leaves a lot to be desired. Many years ago, Doug Elvers recommended that a catalog of magnetic signatures of various kinds and configurations of objects be compiled and I always thought that was a good idea.

The interpretive paleogeographic maps that I have seen seem to run the gamut from something analogous to "stick figures" to abstract art. I think the level of feature delineation presented in the offshore Sabine report (Pearson et al. 1986) represents the minimum level for which block surveys should strive. Of course, there are limits to how well this can be done if each lease block is interpreted on its own in the absence of regional mapping. Here again the path points toward upgrading the baseline studies through some means of synthesizing both the magnetometer and sub-bottom survey data.

Bottom sampling: Positive identification of sites probably is the area in which the most striking gains have been made. Low tech approaches such as fathometers have been used to very good effect off Florida where offshore sedimentation is low. In the northern Gulf, the Park Service and MMS-funded studies to develop and test core analysis techniques (Gagliano et al. 1982; Pearson et al. 1986) have effectively demonstrated the usefulness of those approaches. The needs facing us in bottom sampling techniques primarily have to do with identifying more data sets that can be extracted from core samples and in identifying the criteria one would use in other OCS areas to distinguish cultural from non-cultural sediment.

Recommendations for the Future

In my opinion, Bureau of Land Management (BLM)/MMS management and staff deserve a lot of credit for supporting OCS cultural resource studies and management processes over the past 15 years. When we consider how poorly defined OCS prehistoric archaeology has been as a technical subject over most of that time period — unlike, say, marine biology — it is clear to me that BLM/MMS people took an awful lot on faith. Until you have had the experience of being responsible for environmental program decisions in a diverse enterprise such as OCS development, you can't imagine how far out on a limb they must have felt at times with very little more to sustain them than the gut feeling that some day the archaeologists would "bring home the bacon."

Well, now I think we can safely say the bacon has been brought home. There is a workable administrative process that has withstood the rigors of practical operations over an extended period of time; we have developed and tested concepts, techniques and methods for finding and evaluating both historic and prehistoric sites. Quite a few sites have now been found on the shelf, even if not directly as a result of industry lease operations. Now the archaeological community and the Federal government must go forward over the next decade, consolidating and refining the science and technology of submerged cultural resources management. There are roles for both the Federal and the non-federal sectors.

At the Federal level, MMS should continue to define and elaborate its role in the large-scale synthesis of offshore information and in the adoption of standards. There are several topics in this area to which I recommend they give consideration.

1. Explore the feasibility of developing an offshore cultural resources protection plan and research design for the next decade — a Year 2000 plan — that could provide an interdisciplinary focus for MMS studies as well as those of States, universities, and industry to work in a complementary relationship. Under MMS's leadership or instigation it should be feasible to convene a working group of Federal and non-Federal submerged sites specialists to draft such a plan and research design around which a professional and managerial consensus could form.

2. Establish standards for certain cultural resources related data collection to improve the capability to merge, consolidate, and synthesize data on a regional basis. We must stop treating each lease block as a separate universe. Steps in this direction have been taken in the MMS guidelines for archaeological reports, but there are more issues to address, and working groups of appropriate specialists could address them.

Standards (or conventions) are needed for such things as documentation of sea level indicators (cf. Tooley 1987), which C14 dating corrections will be used, which stratigraphic reflectors should customarily be used for regional rather than local mapping, testing procedures for core samples, criteria for positive or negative site indicators in core analysis, and probably many more items. For example, when would disaggregated lag deposits from cultural sites be considered valuable information? Guidelines can be established to cover this situation.

3. Undertake regional synthesis of geomorphic and magnetic anomaly mapping. Geomorphic reconstruction, magnetic anomaly interpretation, and evaluation of the probability of cultural site occurrence is difficult for surveyors to do on a lease-by-lease basis without a larger frame of reference. Once some of the standards mentioned above have been developed, MMS should explore ways to compile the results of lease block surveys and miscellaneous other sources such as core studies into composite maps, either in-house or through a contractor.

4. Maintain small open contracts to fund C14 dating, core analysis, or other incidental technical analyses when coincidental and unanticipated opportunities arise.

5. Initiate a project to identify the co-occurrence of high probability cultural resource areas, high probability mineral prospects, and perhaps other features to develop new sensitivity maps for invoking stipulations. Because mineral and archaeological sites occur in specific ecological and geological situations, they readily lend themselves to spatial analysis techniques such as GIS map analysis as the most appropriate way to incorporate them in planning for future resource management. This might be a prime candidate for a GIS project to be conducted by the Metairie office's contractor at Jackson State University.

6. Expand the focus of OCS cultural resource studies. Because habitation sites tend to concentrate environmental evidence about a locality, submerged archaeological sites are likely to provide an alternative and, in some ways, more efficient source of controlled paleoenvironmental data for the drowned terrestrial zones of the coasts. There may even be opportunities for coordination of cultural resources studies with such programs as the Environmental Protection Agency's sea level investigations (Hoffman et al. 1983).

In addition to directions the Federal government might consider, there likewise are many opportunities for significant contributions from non-Federal organizations with or without Federal funding assistance.

1. Continue surveying for submerged sites. Although the competition for funding is stiff, survey research in the nearshore and inner continental shelf provides the linkage between terrestrial geomorphology and archaeological distributions and those on the outer continental shelf. This is an eligible Historic Preservation Fund cost and possibly can be funded from other academic grant and teaching sources.

2. Continue specialized archival research and data collection. Archival research to create and maintain specialized data bases, such as the one described by Garrison on shipwrecks, but also on radiocarbon dates, sea level indicators, submerged paleoecological data, etc. are within the reach of academic and other limited funding efforts, especially when they can be compiled incrementally through the accumulation of student projects or small grant projects.

3. Continue to refine core analysis techniques and develop baseline indicators appropriate to specific localities. Two possibilities that recently came to my attention are Gail Chmura's work on reconstructing paleosalinities through C13 ratios (Chmura 1988) and the work of fire ecologists on extracting and interpreting charcoal from cores (e.g., Patterson et al. 1987). We should also test and evaluate whether to incorporate a search for volcanic ash to permit correlation of offshore data with atmospheric and climatologic reconstructions (Muto and Gunn n.d.; Hirschboek 1976). Such research and developmental projects are feasible with modest funding.

4. Establish official recognition of OCS cultural resources by incorporating them in listings such as the National Register of Historic Places. Because of limited Federal grant assistance and relatively limited Federal development activity, the practical impact of listing properties in the National Register is not as great as it once was. However, at a time when there still is a need to show the rest of the offshore community that there really are important cultural resources on the continental shelf, what better way is there than to have prehistoric sites (and perhaps shipwrecks too if the locational data are not too sensitive) listed in the National Register? Sites such as Pearson's Sabine Pass 6 sites (Pearson et al. 1986), Ruppe's Venice sites (Ruppe et al. 1980), and probably some of the Florida offshore karst area sites are all listable or could be formally determined eligible.

5. Synthesize the paleoenvironmental information for various regions of the continental shelf to create models of early coastal geography that are realistic rather than stereotypical. For example, in the Gulf of Mexico, the tremendous outflow of freshwater during Paleoindian times may have eliminated brackish water estuaries and caused brackish water habitats only to exist in the open Gulf instead. Indeed, the presence of a brack-

ish fauna around Stetson Bank in Deweyville/Paleoindian time suggests offshore refugia in the Gulf of Mexico for species such as *Rangia cuneata* that otherwise became extinct on the South Atlantic coast. As a result, it may be unrealistic to expect early Paleoindian shell middens in the northern Gulf; instead, we should see exploitation of a coastal ecology unlike any present-day analogues. These situations are theoretically complex and must be carefully evaluated. This is probably better done in an academic than a contractual setting.

These lists probably could be extended further, but I think they convey a notion of what can be done now. The past 15 years have primarily been an organizational and a developmental phase for OCS studies. The next decade probably will be marked less by technological improvement than by significant expansion in data. How well and how much this is done will not be determined solely by the archaeological community responding to whenever the Federal government contributes funding. Unquestionably, Federal special studies funding could be put to very good use, but we will advance as well in proportion to the degree the Federal and non-Federal agencies treat the study and protection of OCS cultural resources as a collaborative enterprise.

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LAWRENCE E. ATEN
NATIONAL PARK SERVICE
P.O. BOX 37127
WASHINGTON, D.C. 20013-7127