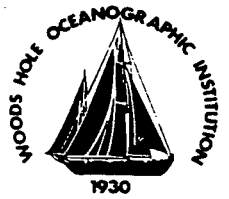

Historic Shipwreck Management:

Meeting of Experts

Final Report*

24 March 1992

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* This Final Report is a result of research sponsored by NOAA National Sea Grant College Program Office, Department of Commerce, under Grant No. NA90-AA-D-SG480, Woods Hole Oceanographic Institution Sea Grant project No. E/L-3-PD. The U.S Government is authorized to produce and distribute reprints for governmental purposes notwithstanding any copyright notation that may appear hereon. As a planning document, the editor welcomes constructive criticisms and suggestions.

Historic Shipwreck Management--Meeting of Experts

Introduction

There has been recent spectacular growth in the demand for and resource value of submerged cultural resources such as historic shipwrecks. (Historic shipwrecks are defined here to include any submerged shipwreck that has value--tangible or intangible--in addition to or instead of commercial salvage value.) Rapid advances in marine exploration technologies are revolutionizing capabilities to find and use these resources. The pace at which technology is expanding the discovery of and access to submerged cultural resources appears to have outstripped institutional abilities to ensure resource conservation.

These events present a dilemma for marine scientists and engineers who develop advanced marine technologies and who may be involved in value conflicts over the conservation of historic shipwrecks. This dilemma cannot be resolved or even examined properly without a clear understanding of the following factors: the effects of technology development, the influence of legal rules and ethical norms, and the structure of institutions, such as markets, through which the attributes of submerged cultural resources are allocated.

With sponsorship from the National Science Foundation, an interdisciplinary research team led by scientists at the Woods Hole Oceanographic Institution (WHOI) has begun to examine these factors and value conflicts. The project is entitled: "Advanced Marine Technology and Historic Shipwrecks: Conflicting Values and Principles of Professional Responsibility" [NSF Grant No. DIR-9114699]. In order to develop a set of "working premises" for this research, to get a firmer grasp on the fundamental issues involved, and to help plan certain details of the research, a one day Meeting of Experts was convened at WHOI in January 1992. This meeting was sponsored with "new initiative" funds from the National Sea Grant College Program [NOAA Grant No. NA90-AA-D-SG480].

The Meeting of Experts involved members of an Advisory Board and researchers from the NSF Project as well as invited practitioners from the field. The participants represented the fields of marine archaeology, law, ethics, economics, marine science and technology, and public policy. At the meeting the participants concentrated on identification and characterization of the most important issues that should be addressed in a comprehensive program of research. Special attention was directed at the impacts of the factors listed above on the technology development and exploration activities of marine scientists.

The meeting was structured around short presentations focusing on the identification of those issues deemed the most important for future research. Each participant prepared an abstract of his or her remarks which was distributed at the meeting. A set of "working premises and fundamental issues" was identified. Finally, a set of topical research areas was drawn up.

This document is a Final Report to the WHOI Sea Grant Program. It is arranged as follows. First the "working premises and fundamental issues" are listed and explained. Second a Preliminary Research Plan that outlines research topics is presented. These two sections are followed by three sets of Appendices: (1) the Abstracts written by the participants; (2) a list of the participants; and (3) the agenda for the Meeting of Experts.

The editor would like to thank David Ross, Director of the WHOI Sea Grant Program, the Principal investigators and researchers on the NSF project, the participants at the planning meeting, and Ellen Gately, Suzanne Demisch, and Sarah Repetto for their assistance.

One. Working Premises and Fundamental Issues

(1) Historic shipwrecks are multiple-value resources. Historic shipwrecks are resources which may be valued for many different purposes and uses. There is no *a priori* presumption that any particular use will always take priority over all other uses. The sources of value range from their uses as purely public goods (to derive archaeological or historic information, as a memorial, or as recreational sites) to their uses as private goods (commercial salvage, treasure hunting, pot hunting). Under the "liberal conception of value" employed by some social scientists, it may be possible, in theory, to measure these kinds of values to help guide "optimal" social choice about how best to use historic shipwrecks. However, there may be additional sources of the value of historic shipwreck resources, such as cultural, political, or social "identity", that are not fully captured within the scope of the liberal conception of value. The extent to which these sources of value in fact exist, their relevance if they do exist, and whether or not they should be incorporated into decisions about the use of historic shipwrecks are subjects that deserve further research.

(2) Pragmatism versus doctrine in marine archaeology. There is a division within the field of marine archaeology with respect to the ways in which historic shipwreck research projects should be conducted. This division reflects a larger debate within the profession of archaeology itself, as exemplified by the varying degrees of strictness regarding trade in artifacts found in the codes of conduct of the different professional societies. The field of marine archaeology might be characterized as divided into two camps: pragmatist and doctrinaire. Most archaeologists would agree that archaeologically or historically important sites could be compromised or destroyed by unrestrained or unguided commercial exploitation or by random or systematic depredations (looting). But some pragmatists believe that professional archaeologists should be involved in commercial projects so that there is some hope of conserving archaeological or historical data and information. The doctrinaire eschews commercial projects because of the potential (no matter how small) of compromising the scientific standards of archaeology. The doctrinaire would seek to leave historic shipwrecks untouched until archaeological research can be conducted in a manner that is unaffected by commercial influences. The pragmatist recognizes the inevitability of illicit "plunder" and that the discovery of shipwreck locations may render the doctrinaire's position untenable, even with strict prohibitions on commercial recovery. Is it possible for technological advances to ameliorate or eliminate this division within the archaeological community?

(3) Guildism. Groups of individuals, such as professional archaeologists, lawyers, and scientists, or institutions, such as museums, have established their own standards or codes of conduct ("ethical rules") to govern intra-group professional conduct. These standards help to define a group, to facilitate the cohesion of its members, and to maintain its continuity. What is the extent to which such standards have external effects (positive or negative) on the welfare of individuals or institutions outside the relevant group? Do technological advances have an effect (and if so, by how much and in what ways) on the evolution of group standards?

(4) Distinction between professional codes and ethics. There is a big distinction between the philosophical field of ethics and professional codes of conduct (sometimes called "ethical rules"). Instead of philosophical ethics, it might be more appropriate in our study to focus on issues of "moral responsibility". (The extent to which issues of moral responsibilty are appropriate focuses is a crucial part of the initial research effort.) Moral responsibilities may arise from special knowledge or resources held by an individual, a group, or an institution that, if utilized, may have an effect on the welfare of others. For example, we might ask whether or not scientists have a moral responsibility to conduct research with

integrity because the results could be used by policymakers in a way that affects the welfare of society. Differences in power between interested parties might also imply that more powerful parties have a moral responsibility not to exploit adversely the welfare of the less powerful. What are the relevant moral responsibilities of the different historic shipwreck interest groups? Are these moral responsibilities relevant?

(5) Involvement of archaeologists at the outset of a project. Some archaeologists have concerns about the potential for advanced marine technologies to affect adversely the integrity of archaeological science. Such concerns may arise in part from a lack of experience with the use of these technologies or unfamiliarity with their capabilities. In many cases, advanced marine technologies may substantially reduce the time, effort, and other costs associated with mapping, data collection, and selective recovery. These advantages are particularly manifest in the case of deep water archaeology. Training and early involvement of archaeologists on projects concerning the exploration or recovery of historic shipwrecks with advanced marine technolgies can reduce or eliminate these kinds of concerns. How can this be accomplished, and how extensive might the effects be?

(6) Fostering interaction between engineers and archaeologists. Many advanced marine technologies are produced for end uses (defense needs, mineral exploration and development) other than for marine archaeology. But these technologies may also be available for many marine salvage and archaeological applications. "Non-invasive" technologies in particular (Exact-Tracking, SHARPS, underwater photography, remote sensing tools, seabed penetrating sonars, others) may be able to meet the stringent archaeological requirements of precision mapping, measurement, and studying cultural resources without disturbing the location of artifacts or limiting knowledge about their provenance. In order for these technologies to be useful tools for marine archaeologists, interactions between archaeologists and engineers should be fostered. What are their respective incentives, and how might this be accomplished?

(7) Project transparency. Two fundamental goals of professional archaeologists are (1) uncovering new knowledge and (2) sharing new knowledge. If these goals are obscured or undermined by projects, commercial or otherwise, that are conducted under a veil of secrecy, then ethical questions are likely to be raised. The extent to which historic shipwreck projects are open to scrutiny and provisions for archaeological quality control made clear at the outset may help alleviate or eliminate ethical concerns. Special consideration must be given to projects in which secrecy is regarded as an important method of preventing the depredation of an archaeological site. Are there other kinds of enforcement or monitoring methods (possibly involving advanced marine technologies) that are as effective as secrecy in preventing depredation?

(8) Distinction between what is right and wrong and how you control behavior. Separate reflection and analyses are required to determine proper conduct and how best to ensure it. The extent to which "irresponsible" behavior can be controlled through changes in public policy or technological advancements could influence the size and nature of any ethical issues. For historic shipwrecks conservation, how can the right/wrong question(s) be answered, and to what extent does the design of control mechanisms depend on the answer(s)?

(9) Structure of incentives is critical. Different parties in shipwreck exploration projects and different prospective users of the resource are clearly responding to different incentives. The manner in which exploration and recovery activities are regulated (by government owners of historic shipwrecks or by the government in the public trust) has an important influence on the existence or size of any problem of moral responsibility. In particular,

overly strict regulation may in some cases lead to perverse results, such as increases in bribery or in the level of illegal activity. For example, it is possible that universities and nonprofit organizations are burdened to a greater extent by strict regulations than commercial treasure hunting firms, because the nonprofits may not have the resources to "bribe" their way out of the regime as effectively. (This may be true especially under strict regimes found in developing countries.) It may be the case that shaping public attitudes (e.g., through the use of educational programs) can be an effective substitute to regulation.

(10) Use technology for solutions. It may be possible to resolve ethical problems through the following technological advances: increased speed of mapping and recording; in situ visitation; software controls; selective retrieval; remote peer review. An important question is: Which sources of value conflict are mitigated by which technological applications? In understanding the influence of technology, it may be useful to distinguish between disreputable archaeology and illicit plunder. Is the technological connection the same for both problems? Can technology be used to solve both problems or only the first?

(11) Better information is needed on the extent of the depredation problem. There is little data and mostly heresay regarding the extent of the depredation of submerged cultural sites. An important (but unanswered) question concerns the degree to which technological advances may have led to increased depredation of these sites. If technological advances lead to increased depredation, then this effect counteracts the beneficial effect of improvements in the field of archaeology through the application of new technologies. What is the net effect of advancements in marine technologies in the field of marine archaeology?

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Two. Prospective Research Plan

This section outlines a series of research papers that will be initiated by the participants on the National Science Foundation project. The researchers responsible for managing these special topics and for producing the paper have been identified in bold. Other researchers listed after the lead researchers on each topic will contribute in various ways to the rersearch and final paper. Early versions of the research papers may be presented or discussed at regional workshops affiliated with one or more professional societies.

Ethical end-use problem

(1) • Background paper describing the ethical end-use problem and issues of moral responsibility (**Whitbeck**; Ballard, Wylie, Ladd, Hamilton)

Technology

(2) • Identify/describe the state-of-the-art in advanced marine technology
- Characterize rate of technological advance, change
- Document applications to shipwrecks (**Ballard, Gallo**; McCann, Garrison)

(3) • Identify sources of technological change
- Demands for hardware and services
- Nature of technological development
- Analyze effects of market structure on rate of technological change
- Examine influence of ethical norms on governmental institutions and technological change

(**Broadus, Hoagland**; Ballard, Gallo)

Regulation and Enforcement

(4) Establish the extent and severity of the problems of illicit activities such as looting and "bad" archaeological practices (**Cohn**;

Garrison, Mastone, Fish, Hoagland)

(5) • Confirm hypothesis that technological change and expanded demand have led to modifications of institutional structure
(Hoagland, Mastone; Ballard, Cohn, Gallo, Oxman, Zhao)

(6) • Examine policy alternatives in which activities of marine scientists or others can contribute to improved management, for example:
  • Remote surveillance technologies
  • Regulation of artifact markets
  • Creation of information clearinghouses
(Mastone, Ballard; Gallo, Garrison, Hoagland, McCann)

(7) • Review relevant international, federal, state law and policy
(Zhao, Cohn; Hoagland, Mastone, Oxman)

Markets

(8) • Identify cases of conflicting values
  • Assess efficacy of existing institutions to resolve value conflicts
(Kaoru, Whitbeck; Garrison, Hoagland, Hamilton, Wylie, Ladd)

(9) • Suggest/apply methods to recognize/compare values
  • Examine cases where benefits can be estimated
  • Relate results of other valuation efforts
  • Compare methods for estimating expected benefits
  • Identify institutional mechanisms that allow balancing of multiple values and uses
(Kaoru; Broadus, Cohn, Garrison, Hoagland, Wylie)

(10) • Application of industrial organization analysis to characterize qualitatively the structure, conduct, performance of modern shipwreck management
  • Selective application of public finance, industrial organization methods in cases where profit maximization is not the objective of firms/other entities
  • Analyze importance of diversity of institutional types in providing shipwreck "products"
(Broadus; Hoagland, Kaoru, Mastone)

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Appendix A: Planning Meeting Abstracts

I. Philosophy and Ethics

Whitbeck, C., Ethical concepts.

Costs and Benefits are those consequences that can be treated as arithmetic quantities.

Moral rights and obligations (and moral rules) specify what types of acts are morally permitted, forbidden or required.

Traits of moral character (focuses on agents and their integrity rather than on acts)--virtues and vices (although these terms have taken on some odd connotations this century).

Moral responsibility is a requirement to secure a good outcome in some matter. The outcome need not be representable as an arithmetic quantity. Often the outcome is some aspect of another's welfare. Exercise of responsibility characteristically involves the exercise of discretion, as contrasted with mere rule following.

Responsibility arises either from either or both of the following: the interpersonal relationship that

one bears to the other, or (e.g., friend-friend, parent-child); the special knowledge that one person possesses relevant to another's welfare (examples--professional responsibility of a physician for the health of her patients, or for the health of a stranger who is an accident victim whom the physician has stopped to help. The responsibility of an engineer for the public safety. The responsibility of a scientist for the integrity of research results.

2. How the assumptions of "economic ideology" effectively confound the examination of values.

Consider the modern tendency to think of everything as a potential resource. To regard everything, even ourselves, as a potential resource is to implicitly regard all possible goals or ends as on a par and effectively by-pass the discussion of values. Notice, however, that one very strong value assumption is implicit in this ideological position: efficiency--that is the efficient use of resources in the pursuit of goals--is implicitly taken as the primary value. The goals or ends are determined by preference or personal taste rather than on the basis of reasoned value judgements. Respect, for example, merely reflects one set of preferences, preferences that may obstruct the efficient pursuit of other preferences. (The general tendency to regard everything as a potential resource has been criticized by thinkers like Martin Heidegger who label it "technological thinking," and by others, like Virginia Held and Robert Bellah, who call it "economic ideology," or the "ideology of economic man." Describing the tendency as "economic" in some sense is less confusing, for three reasons: first, because it takes "economic rationality" as paradigmatic rationality; second, because technological innovation may be motivated by attitudes of reverence for nature and for life, and third, because the tendency to view everything as a potential resource is often carried to extremes in matters that have no connection with technology. For example, the tendency is very much in evidence in contemporary legal circles where proponents of so-called "law and economics," like U.S. Court of Appeals Judge, Richard Posner, advocate eliminating inefficient adoption agencies and legalizing the sale of babies.)

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Ladd, J., Philosophical reflections on ethical issues relating to shipwrecks.

Apart from the political, legal and economic ramifications of the confrontation between conservationists and treasure salvors, from the point of view of ethics the issue is hardly problematic. I shall therefore take another tack and explore some conceptual issues suggested by the conservationists' arguments.

I need to begin with a few remarks on the use of the notion of values as a framework for discussions of ethical issues relating to shipwrecks. For a philosopher, the term "value" is a slippery one. It runs together a number of conceptual issues that need to be distinguished. For comparing "scientific value" with, say, "historic, "recreational," or "economic value" is like comparing apples and oranges. With regard to "values" we need to start by asking questions like; are there false or spurious values as well as true and genuine values; or higher and lower values; or subjective and objective values; or even unethical as well as ethical values?

In connection with these questions, it must be granted that there is a general theory of value, which might be called the "liberal conception of values," according to which everything that might be regarded as a "value" is thrown into the same hopper. The classical formulation of this position is utilitarianism, a theory that is often used as the basis for an economic theory of value. Value, in this view, is an homologous concept that makes anything whatsoever that, e.g. gives satisfaction, a value per se. (Thus, there is room for false or spurious values or for higher and lower values.) Practical issues, e.g. of social choice, are turned into comparative issues of

ranking or weighing values. For this, the usual method is quantitative: more value is what counts.

What I want to suggest here is that many "values" relating to, e.g. shipwrecks, don't fit into this scheme. We need qualitative discriminations that require other dimensions of analysis.

The first thing to note is that the conservation of shipwrecks builds upon and bridges past, present and future. It has an essential time (and historical) dimension that the "liberal conception of value" as such is unable to provide, inasmuch as it presupposes a theory that is essentially individualistic and non-historical. Its theory is committed to the assumption that history, tradition, cultural and social identity (even political identity) are only of contingent significance in the calculus of values. They have no priority. (Preserving the past, e.g. shipwrecks, is, when all is said and done, just a business proposition.)

Against this, I am prepared to argue that as a social, political and ethical animal, human beings live in societies with a past and a future and their lives have meaning only in that setting. History and heritage provide the bonds that tie individuals together over time as members of more or less identical and continuing groups. We should not and must not, of course, become slaves to the past (or to the future); on the other hand, we cannot live meaningful lives without them. For if one accepts an ethics where social relationships and social bonds are paramount, people need to take into account their relationship to past generations as well as to future generations. To do so is a necessary part of a person's self-understanding, which ought to include awareness of res gestae--the glories and tragedies, the nobilities and cruelties, of the past--as attested to by the shipwrecks that are the subject of the present conference.

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Wylie, A., Issues to be considered with "Advanced marine technology and historic shipwrecks".

The ethical and legal problems posed by historic shipwrecks are, indeed, unique, and uniquely complicated, technically and legally. However, there are a number of points of convergence between the difficulties that now arise, as technological developments make these underwater resources accessible, and those that have long been faced by archaeologists and others who deal with onshore cultural resources. I would like to highlight two sets of ethical/political problems that have figured large in these latter contexts and which may be fruitfully compared with those raised by the intensified exploration of historic shipwrecks and related maritime resources.

1. The first are issues raised by the conflicting claims on cultural resources now being made by various cultural, ethnic, and political groups, as well as those who represent scholarly and economic interest in these materials. These have been thrown into particularly sharp relief by the reburial/ repatriation debate, and the establishment of legislation that entrenches the right of native groups to demand the return of skeletal and burial goods (and in some cases other categories of cultural material) relating to their forbears. In effect, in the last few decades the access to archaeological resources that researchers had taken for granted--their right to recover, analyze, and curate archaeological resources--has been substantially challenged; the research community has had to recognize the legitimacy of non-scientific (but also, in this case, substantially non-commercial) interests in the record, and must now negotiate and collaborate much more directly with others who (also) value it as a cultural resource. These developments have profound implications for research practice; as the constituencies to which academics must now be responsive, and the requirements for public education and engagement, are broadened, fundamental questions are raised about the political entanglements

of the research enterprise and about how academic responsibility is to be conceptualized.

2. A second set of issues have to do with the deposition and use of looted data, specifically, the role that academics play (however indirectly or inadvertently) in stimulating the antiquities market that underwrites the looting of onshore, as much as underwater, sites. The Leventen proposal [Leventen, A.C. 1989. A workable proposal to regulate antiquities trade. Biblical Archaeology Review 15(4): 44-46.] raises these issues directly, and has been controversial for this reason. I have written a brief for the Executive of the Society for American Archaeology [Wylie, A. 1991. Archaeology and the antiquities market: the use of looted material. Presented to the Executive, Society for American Archaeology. New Orleans, La. (April)] that addresses them for the perspective of archeological researchers who presumably are not directly involved in the antiquities trade but who nonetheless face dilemmas about their use of archaeological resources, and the uses made of their own analyses and publications, given their conservationist commitments.

The two sets of issues identified here fall under the rubric of the first five general questions listed in the "Project Summary": "What is the proper relationship between marine scientists and commercial salvors, academic archaeologists, museums, entertainment enterprises and other interests..." (p. 7). My central recommendation is that the range of interests that might be seen to have a legitimate claim on submerged cultural resources to be defined broadly, to include not only those of science/scholarship and commercialism, but also, at least potentially, some analog to the political, cultural interest of the native groups that have recently been recognized in the reburial/repatriation legislation.

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II. Archaeology

Mastone, V.T., The impact of technology on shipwrecks: a management dilemma.

The exploitation of shipwrecks is not a new phenomenon. The maritime laws of salvage and finds developed out of a need to protect lives and property, maintain the highways of commerce and communication, and avoid conflicts. They were a means to deal with critical concerns in real time under widely accepted principles of behavior. The traditional concepts embodied understanding or need to understand alternative natural and cultural values which would become attached to these resources over time. Today, the conflict, again, centers on access and possession.

The introduction and application of new technologies and innovations to existing technologies into the process of search, identification, and recovery of submerged cultural resources, chiefly historic shipwrecks, has created a dynamic for greatly increasing access to these resources. Technology has effectively shattered the access barrier. Unfortunately, improved access through changing technology will have dramatic effects on these resources by increasing our ability for exploitation. While the availability, cost, and reliability of technology will continue to play a major role in limiting access to these resources, attention must focus on the responsibilities of all parties interested in these resources.

The passage of the Abandoned Shipwreck Act of 1987 resulted in four immediate consequences. First, it clearly established that ownership and management responsibilities over these resources was vested in the States. Second, it protected and guaranteed the public's access to these resources. Third, it recognized that there exist competing interests in these resources. Fourth, States must develop a management policy which accommodates

a wide range of appropriate uses. The development and implementation of these management policies will have global application.

The type and extent of exploitation will vary between interest groups. There exists overlap, competition, and conflict. The nature and degree of conflict between various user groups is highly variable and irregular. Certain forms of conflict will be easily overcome through educational/informational activities. Value can be defined in several broad areas: (1) commercial value--monetary; (2) intellectual value--historical/archaeological; (3) public value--multiple concerns; and (4) other value--to be defined. However, it might be more appropriate to redefine values in terms of the affects of exploitation derived from the activities of the interest groups. In this way, one might be able to incorporate the issues of conflict directly into the value system.

At the same time, all interested parties must recognize that the management of cultural resources involves a sequence of: (1) inventory--discovery and recording the resources present; (2) evaluation--determining their scientific and public importance; (3) planning--determining how they would be most appropriately used; (4) protection--safeguarding the resource; and (5) utilization--authorizing or otherwise accommodating the proper use [e.g., U.S. General Accounting Office. 1987. Cultural resources: problems protecting and preserving federal archaeological resources. RCED-88-3. Washington: U.S. Gov't Ptg. Ofc. (June)].

Therefore, the key tasks to be addressed by this research are: (1) to identify and characterize values (monetary, aesthetic, scholarly) attached to submerged cultural resources with particular attention to historic shipwreck resources; (2) to clarify issues of professional responsibility and standards which influence the exploitation of these resources; and (3) to increase and improve cross disciplinary understanding and public awareness of the diverse concerns, needs, and objectives associated with the exploitation of these resources.

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McCann, A.M., Abstract (untitled).

I. Where the Archaeologist is coming from. A discussion of the professional archaeologists point of view and his responsibilities.

Codes of Ethics of some of our professional organizations will be presented, including that of the Archaeological Institute of America (AIA), Society for Historical Archaeology (SAA), Society for American Archaeology (SAA), Society of Professional Archaeologists (SOPA), Maritime Archaeological and Historical Society (MAHS).

For example, the Archaeological Institute of America: "The AIA is dedicated to the greater understanding of archaeology, to the protection and preservation of the world's archaeological resources and the information they contain, and to the encouragement and support of archaeological research and publication.

In accordance with these principles, members of the AIA should: (1) Seek to ensure that the exploration of archaeological sites be conducted according to the highest standards under the direct supervision of qualified personnel, and that the results of such research be made public; (2) Refuse to participate in the illegal trade in antiquities derived from excavation in any country after December 30, 1970 when the AIA Council endorsed the UNESCO Convention on Cultural Property, and refrain from activities that enhance the commercial value of such objects; (3) Inform appropriate authorities of threats to, or plunder of archaeological sites, and illegal import or export of archaeological material." (AIA)

The Society for Historical Archaeology: "The collecting, hoarding, exchanging, buying or selling of archaeological artifacts and research data, for the

purpose of personal satisfaction or financial gain, or the indiscriminate excavation of archaeological sites, including underwater wrecks, are declared contrary to the purposed of The Society."

The Maritime Archaeological and Historical Society: "That historic sites shall not be disturbed, nor shall any artifacts be removed for any reason not directly related to the purpose of research."

The Society of Professional Archaeologists: "An archaeologist shall actively support conservation of the archaeological research base."

The Society for American Archaeology: "Inasmuch as the buying and selling of artifacts usually results in the loss of context and cultural associations, the practice is censured."

II. The Archaeologists responsibility to the unfolding marine technology community and the technology community's responsibility to us.

Discussion of the need to learn about the technology available and share and help train archaeologists in its use.

The need to become involved in collaborative research projects, share our expertise, guide the conservation, publication, and sharing of knowledge through museum exhibition nd promotion of constructive tourism projects for the public. (Education through recreation projects, as the Underwater Parks in Florida and elsewhere.)

The need for training seminars for archaeologists to learn about advanced marine technologies. Those designing the new technology also need to consult the archaeologist and learn his needs. (For example, video overlays, and other ways to help process vast amounts of data.)

III. The requirements of the professional Archaeologist when collaborating with a technical team. (1) The need to be involved from the beginning in the planning process, including the selection of a significant site and a plan for the ultimate destiny of the artifacts. (2) Mapping of the site and documentation of significant features accomplished before removal of any artifacts. (3) Decision for removal and recovery of objects in the hands of the archaeologist, with consultation with conservation team and engineers. (4) Assurance that adequate conservation and storage of artifacts possible. (5) Access to all data, and control of data (photographs, videos) with other appropriate scientific member of the team. (6) Archaeological integrity of the site must be preserved and documented. If sale of objects is anticipated, this must be carefully defined and agreed upon beforehand, with the scholarly value of the collection assured. (7) Publication of the material should be in the hands of the scientific team and shared royalties of publications and media use of research agreed upon.

IV. Problem Areas to be Discussed: (1) Can archaeologists and "Treasure Hunters" collaborate? (2) Can archaeological artifacts be sold? (3) Financing of deep sea archaeological research.

V. Suggestions for the Future: (1) Encourage training of more qualified underwater archaeologists. Educational projects such as the JASON Projects are ideal opportunities to encourage young people to go into this field. (2) Archaeologists need to work more actively within their own individual professional organizations, as well as take responsibility to share our knowledge to the broader public; take opportunities to speak and dive and interact with local recreational sports diving groups. (3) Avoid professional territorialism. Keep an open mind for new solutions and collaborative efforts, realizing that interdisciplinary research brings forth new knowledge for all. Help educate the public to preserve together our heritage.

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Hamilton, C.E., Some suggested topics for "Advanced marine technology and historic shipwrecks: conflicting values and principles of professional responsibility".

(1) It has been suggested that, "just because it's legal doesn't make it ethical," and that archaeologists should, under no circumstances, work for, or otherwise cooperate with, anyone who accesses a shipwreck site for the purpose of private profit. The foregoing statement still guides the attitudes of many if not most underwater archaeologists in the U.S. However, regarding Cultural Resource Management (CRM) of shipwrecks in the US, as well as being contradictory to the Abandoned Shipwrecks Act of 1987, this attitude is contrary to the approach to CRM expressed in The Treatment of Archaeological Sites: A Handbook, which was co-authored by representatives of State, Federal and private agencies concerned with CRM archaeology. Indeed, this paradoxical attitude is most clearly expressed in the censorship of papers and articles dealing with privately salvaged shipwrecks cited by some "Peer Review Committees" partly composed of individuals who are employed by the same agencies responsible for overseeing the proper conduct of CRM archaeology as expressed in the 'Handbook' and The Abandoned Shipwreck Act. Therefore, an important question is, "how can the private sector be expected to comply with CRM regulations when the archaeologists and other scientists they need to employ are actively discouraged and/or punished by professional 'gatekeepers' who utilize their own private agenda in determining what is ethically admissible in professional meetings and publications, rather than the expressed guidelines on the subject produced by CRM agencies and related private groups?"

(2) What is the definition of 'ethical' as it relates to archaeology? Is it achieved by following scientific methods and regulatory guidelines in the conduct of excavation, conservation analysis and reporting, or is it achieved through the having all shipwreck sites and subsequent artifacts being held within the public domain, or both? Also, does the need to acquire information from an archaeological site, destined to be disturbed or destroyed for non-scientific reasons beyond the control of archaeologists, supersede the need to present a 'united front' against excavation initially motivated by non-scientific interest? Are scientific interests inherently superior to financial interests? Are archaeological and commercial interest irreconcilable?

(3) What are the public benefits of private involvement in archaeology? Is it possible that private 'profit making' ownership of historic materials might relieve a burden from tax-payers, given the collection remains publicly accessible, intact and properly curated?

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Garrison, E., Abstract (untitled).

Advanced marine technology has done more to unlock or solve mysteries of historic shipwrecks in the past three decades than any other tools used in their pursuit and study. Pertinent examples are **Monitor**, **Titanic**, **Bismarck**, and **Alabama**--all names that once signified some of history's most famous lost shipwrecks. All were found with marine technology's children--side scan sonar, magnetometers, low-light cameras, ROVs, and submersibles. The suite of equipment grows with CHIRP sonar, lasers, autonomous vehicles and other devices joining the already formidable assemblage available to those who would search and study these wrecks.

Famous, lost ships remain such as the World War I French minesweepers claimed by Lake Superior not far from the site of the **Edmund Fitgerald**. I believe an important issue to be

addressed by this meeting is to identify the "who" in the questions of who to seek historic ships and to examine the "why" as well. At NOAA we find ships all the time during our charting surveys. Wreck divers read our public listings like many read racing forms. Technology finds their new targets and leads to the exploitation of the once hidden wrecks. This is a problem for we here at NOAA as it is for the larger area of the world ocean where statutes and conventions fade in the blue water. One solution at NOAA is the protection that our National Marine Sanctuary Program affords historic shipwrecks within their bounds. Perhaps this venue is one that has merit in modeling programs for protection after technology has done its job.

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III. Technology

Ballard, R.D., Abstract (untitled).

A major conflict that deals with the long-term handling of historic shipwrecks on the bottom of the sea deals with the following basic questions:

What is a historic shipwreck?

When should recovery be carried out and when should it not be done?

Rapid advances in underwater technology have raised the spectra of establishing underwater preserves which permit in-situ visitation instead of recovery. What is the timing and likelihood of this technological capability taking place?

The increased rate at which historic shipwrecks are being discovered in the deep sea is more a reflection of the development of technology than the unique qualities of any individual or entrepreneur. If that is true, why should anyone be able to lay claim to a ship he discovers and possibly destroy important historic or archaeological information in the process of recovering valuable artifacts for the purpose of profit. In other words, should the mere fact you find a historic shipwreck give you the right to recover material from it? This, perhaps, is a conflict between what may be legally right but morally wrong.

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Gallo, D.G., Planning meeting on advanced marine technology and historic shipwrecks: conflicting values and principles of professional responsibility.

Over the past decade, our ability to image the undersea has been greatly improved by the rapid emergence of new visualization technologies. These technologies include platforms (robots, towed-vehicles etc.), sensors (sonar, cameras, etc.), and other enabling technological advancements (navigation systems, data processing, telemetry). A good portion of these technologies have been born through defense oriented research and development programs and needs or because of purely academic interests. Regardless of why and how these technologies have been created, many are finding their way into the "shipwreck" arena. The ability to locate and to process shipwrecks will become easier with time.

I find two general issues of interest: (1) The emergence of the new technologies has given rise to large scale mapping programs conducted with government funds. These programs, such as the USGS/NOAA Exclusive Economic Zone mapping project will attempt to completely characterize the seafloor proximal to the continental shelf of the United States and associated territories. Similar mapping projects are being conducted by other countries as well. Although these programs will initially be focused on regional scale "broad-brush" mapping, subsequent efforts are devoted to identifying and characterizing smaller scale features. These programs will undoubtedly lead to the "discovery" of numerous shipwrecks. How will

these be processed? Who is responsible?

(2) Universities and especially oceanographic R&D laboratories will continue to develop newer and better seafloor imaging technologies. Much of this research is conducted with government funding. What is the responsibility of the these institutions to become involved with the location and processing of shipwrecks? What are the guidelines? Does the involvement have to include rigorous archaeological techniques? Is it okay for an institution to become involved in such a program in an attempt to raise funds either through leasing its assets or through recovery of artifacts? What is the proper procedure for processing shipwrecks with minimum effort?

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IV. Markets

Broadus, J.M., Historic shipwrecks: economics, markets and public policy.

Shipwrecks are resources because they are useful. Like other resources, their allocation across uses and over time is determined through an interplay of market forces and governmental intervention. There are good reasons in principle to expect well-functioning markets to produce socially-efficient allocations. Market failure, however, justifies public intervention to correct misallocations and inequities. In the case of historic shipwrecks, a number of classic sources of market failure may be present: the public goods character of some shipwreck benefits; incompletely-defined or contested property rights; open access; and intergenerational externalities. External effects of technological development on shipwreck discovery and access may engender failure in both technology and shipwreck markets.

There are well-known, if imperfect, tools of public intervention to address all these sources of market failure. The task of public policy is to determine the best mix of markets and interventions under all conditions. If public policy is well-formulated and effectively-implemented, the general issue of the engineer's "responsibility" should disappear (though idiosyncratic problems of personal ethics may remain).

Four points are noteworthy:

(1) The resource allocation problem here is dynamic in vital ways. Not only are the nature of demand for the resource and the technology for its exploitation changing over time, so is the nature of the resource itself. In this way, shipwrecks may be seen as more like ripening cheese or fine old wine than, say, mineral deposits. How well can we model the public policy problem in this dynamic context?

(2) Some uses may be seen as having a priority beyond economic valuation: for example, memorial uses or stored archaeological value. Do they? Is it useful to consider lexicographic allocations in which some uses are always allowed to dominate? When?

(3) The effectiveness of different types of public intervention (vesting rights, taxes, subsidies, regulations) depends in part on how the subject markets are organized. How well can we characterize the organization and interaction of relevant markets and other institutions in our problem?

(4) More generally, in the full sweep of the problem, how well can we identify, relate and measure the various demands, potential benefits, exploitation costs, sources of market failure, and effects of remediation affecting the allocation of these resources? How extensive can our scope be, how intensive our focus?

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Kaoru, Y., Evaluation of shipwreck management alternatives.

Historic shipwrecks are important resources, requiring sensible management in order to maximize benefits from their uses. The Abandoned Shipwreck Act of 1987 gave title over certain classes of shipwrecks to coastal states in whose water they lie. This implies coastal states must come up with management plans for these shipwrecks. Shipwreck resources can be utilized in a variety of manners. For example: cultural and historical preservation; creation of marine parks; relocation of shipwrecks to other sites where their preservation or recreational values can be enhanced; and partial or total salvage of artifacts. These management alternatives need to be evaluated in order to determine the best uses of the resources.

While market values of artifacts recovered from shipwrecks can be observed from existing treasure hunting or antique auctioning activities, recreational and cultural values of these resources are not directly observable from existing markets. This implies that by no means are preservation or recreational uses of these resources worthless. In order to place preservation and recreational use alternatives on the same footing as salvage values of artifacts, policy makers need to measure values of these management alternatives in a comparable unit, namely dollar values. What I see as an important issue to be addressed is measurement of recreational and preservation values of historic shipwrecks. Some of the questions I am interested in are:

- How much do visitors to a marine park value an opportunity to see a historic shipwreck there?

- How much do people value preservation of a historic shipwreck at its original site even if they may never actually see or visit that shipwreck?

- How much does partial salvaging of artifacts from a shipwreck reduce or enhance people's value placed on that shipwreck?

- How much do people value seeing historic shipwrecks on books or videos? Do these "non-consumptive" values change if the original shipwrecks were commercially salvaged or removed from the original sites?

No two shipwrecks are exactly alike in cultural or historical significance. The best management alternatives are likely to be different across individual shipwrecks. Keeping shipwrecks like **USS Arizona** and **RMS Titanic** intact at the original sites may serve best for memorial purposes. For other shipwrecks, salvaging some artifacts and placing in museums or even selling in commercial markets may enhance people's value or appreciation of history and the original shipwrecks. Relocation of certain shipwrecks from their original sites to museums or marine parks may potentially bring higher values to the society by providing wider exposures or recreational use opportunities. Again, decisions have to be made based on careful comparison of management alternatives and their associated costs and benefits.

Closely related issues are evaluation of shipwreck characteristics and management of a "portfolio" of shipwreck resources. A research to investigate specific characteristics of shipwrecks which are valued by the public will offer very useful information for management decisions. Shipwrecks are different in their ages, water depth, sizes, locations, historical and archaeological significance, and salvage values of artifacts. These characteristics should be individually evaluated to determine their linkage to the total value of each shipwreck. It is important to determine which characteristics are more valuable than others so that management priorities can be placed on preservation of such characteristics.

Evaluation of shipwreck characteristics will also lead to better management of shipwreck portfolio for the nation. Approximately 10,000 shipwrecks are

known to exist in the U.S. waters. As appropriate authorities decide management plans, they must sort out suitability of these shipwrecks among a variety of potential uses. The best management plan for each shipwreck is likely to depend on availability of substitute shipwrecks which are similar in characteristics or historic and cultural values. A unique shipwreck for which no other shipwrecks come close in historic and cultural values may be best utilized by totally preserving it. On the other hand, moderately unique or non-unique shipwrecks may best serve the public by, for example, salvaging them or relocating to marine parks for exhibit. In order to make these management decisions, policy makers need to know which characteristics of each shipwreck are more valued by the public.

I feel that theories and principles to be used for management of shipwrecks are not much different from those of natural resource economics. Shipwrecks can be interpreted as non-renewable resources whose utilizations need to be carefully studied in order to "extract" best uses out of them. The major difference between economics of extractive/non-renewable resources and management of shipwreck resources is the fact that benefits derived from shipwreck resources are not exclusively monetary values registered in market transactions. Recreational, historical and preservation values, among others, of shipwrecks are not directly quantifiable. However, recent developments in environmental and resource economics offer a variety of techniques which can be utilized to place monetary values on these traditionally non-quantifiable values. Uses of these techniques for historic shipwreck management is a new attempt and will generate practical information to help coastal states' management of shipwreck resources.

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Hoagland, P., Taxation and the recovery of cultural resources.

A fundamental premise of the research proposed in this project is that ethical issues faced by marine scientists in the development of technologies for the exploration and recovery of historic shipwrecks may be reduced or eliminated through the selection of appropriate public policy. In 1988, the enactment of the federal Abandoned Shipwrecks Act [P.L. 100-298] reshaped public policy in the United States by making it clear that title to certain kinds of abandoned shipwrecks is now held by coastal states. Coastal states, in turn, have implemented their own more specific public policies to govern the disposition of the historic shipwrecks to which they have clear title. The laws of several states, including those of Massachusetts and Florida, contain provisions for the licensing of exploration and salvage activities and for the conduct of archaeological research.

Coastal state laws may also include provisions requiring that a portion of the proceeds of the sale of artifacts salvaged from historic shipwrecks be paid to the state. This payment can be viewed as a kind of royalty (or a tax depending upon the exact wording of the relevant legislation), to which the coastal state as owner of the resource may believe it is entitled. In a very direct sense, the collection of royalties from the recovery of cultural resources, such as historic shipwrecks, is analogous to the recovery of royalties from the development of natural resources, such as minerals, on the public lands or on the outer Continental Shelf.

Unlike some kinds of mineral deposits (such as the uniform grade porphyry deposits of the southwestern United States), historic shipwrecks are heterogeneous resources. Historic shipwrecks have different characteristics that are valued for different reasons; for example, the wreck of the **S.S. Central America** is valued not only for its cargo of gold (a "private good") but also for its historic linkage to the California Gold Rush era and for the knowledge that it provides about unique biological species ("public goods").

A potentially fruitful line of research would examine the effects of royalties (or taxes) on the optimal recovery of historic shipwrecks as heterogeneous resources. Recent research in economic theory has investigated the optimal depletion of heterogeneous mineral deposits, which may shed light on the cultural resource problem. An interesting problem arises if, for example, the royalty (or tax) causes the recovery operation to be terminated earlier than it would be without the royalty. Early termination might have an adverse effect on the conduct of archaeological or historical research. The ultimate effect of the royalty (or tax) may depend upon the way in which it is administered or the point in the recovery process at which it is exacted.

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V. Law

Oxman, B.H., Abstract submitted for Woods Hole project on advanced marine technology and historic shipwrecks.

A. Are additional legal incentives needed: (1) to promote research and discovery; (2) to promote dissemination of knowledge; or (3) to accommodate conflicting interests in the disposition and use of objects found?

B. To what extent is it preferable or appropriate to rely on professional self-regulation and sanctions to provide those incentives?

C. To what extent should those incentives be supplied by: (1) local, national or international law; and (2) reflected in rules of: (a) property and civil liability; (b) taxation; (c) administrative regulation; or (d) criminal law?

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Cohn, A.D., The implications of advanced marine technology and historic shipwrecks to the Abandoned Shipwreck Act of 1987.

The United States Congress enacted legislation over historic shipwrecks from the Federal Government to the States. What implications does advanced marine technology have for American submerged cultural resources into the 21st century? Can advances in marine technology be utilized to locate, evaluate and increase access to historic shipwrecks within the definitions and purposes of the Act? How does the development of advanced marine technology affect the cultural resource management infrastructure? Can this new technology be utilized to make these sites "accessible" to the non-diving public through remote documentation and public interpretation? Is there a need to define protocols for access and protection of newly accessible "deep water" sites?

How can Advanced Marine Technology be applied by researchers to inventory and document submerged cultural resources? How can cultural resource managers, researchers and archaeologists gain access to information about the new advances marine technology? How do managers, researchers and archaeologists gain access to the technology?

What are the implications of Advanced Marine Technology to Historic Shipwrecks in the West Indies? The development of advanced marine technology has exposed a once protected stratum of cultural resources to the hand of man. These finite resources are currently being mined in the West Indies by private parties. Some of this work is done in conjunction with local governments while some is executed as a covert activity. What is the nature of the contractual agreements between salvors and Island governments? Can the extent of the covert activity and the impact on cultural resources be quantified? Can this information be utilized as a basis for development of an international set of "standards of practice" to guide governments, institutions and

researchers worldwide?

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Zhao, H., Some suggestions for issues to be addressed by the NSF historic shipwreck project.

Rapid advances in marine exploration technologies have made it feasible to access historic shipwrecks in deep waters beyond the territorial sea (e.g. the discoveries of the historic shipwrecks **Monitor**, **The China**, **Atocha**, **Titanic** and **Central America**). However, in the absence of a clear international management regime, discoveries of historic shipwrecks beyond the territorial sea have resulted in legal disputes. To help work out some solutions to the disputes, I would like to discuss the following questions:

(1) What is the legal status of historic shipwrecks? Does the status differ in different maritime zones?

(2) Whether or not the maritime law of salvage and the law of finds are proper laws for historic shipwrecks?

(3) Whether or not coastal states have jurisdiction over historic shipwrecks beyond the territorial sea?

(4) Whether or not scientific exploration of historic shipwrecks and marine archaeological research can be considered to be a kind of marine scientific research subject to the international legal regime of law of the sea?

(5) What principles and rules in international law should be applied to historic shipwrecks and how to promote the development of international law for protection and management of historic shipwrecks and other marine cultural resources beyond the territorial sea?

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Appendix 2: **PARTICIPANTS LIST**

Planning Meeting 24 January 1992

Participant	Project Role (Discipline)
Dr. Robert D. Ballard Department of Applied Ocean Physics & Engineering Woods Hole Oceanographic Institution Woods Hole, MA 02543	Principal investigator & Project advisor (Marine Technology)
Dr. Noel Broadbent Arctic Social Science Program Director Polar Programs Division National Science Foundation 1800 G Street, N.W. Washington, D.C. 20550	NSF Sponsor (Archaeology)
Dr. James M. Broadus Marine Policy Center Woods Hole Oceanographic Institution Woods Hole, MA 02543	Principal investigator & Project advisor (Economics)
Mr. Arthur B. Cohn Director Lake Champlain Maritime Museum Basin Harbor, Vermont 05491	Project consultant (Law)
Dr. David Gallo Coordinator of Industrial and International R&D Programs Woods Hole Oceanographic Institution Woods Hole, MA 02543	Principal investigator (Marine Technology)
Dr. Ervan G. Garrison Sanctuaries & Reserves Management Division/NOAA Universal Bldg. South 1825 Connecticut Avenue, N.W. Washington, D.C. 20235	Project advisor (Archaeology)

Participant	Project Role (Discipline)
Dr. Christopher Hamilton 70 Middle Road South Chatham, MA 02659	Invited participant (Archaeology)
Mr. Porter Hoagland Marine Policy Center Woods Hole Oceanographic Institution Woods Hole, MA 02543	Research associate (Public Policy)
Mrs. Lisina Hoch Matthiesen Park 39 North Broadway Irvington-on-the-Hudson, NY 10533	WHOI Associate and Sponsor
Dr. Yoshiaki Kaoru Marine Policy Center Woods Hole Oceanographic Institution Woods Hole, MA 02543	Asst. Social Scientist (Economics)
Professor John Ladd Dept. of Philosophy, Box 1918 Brown University Providence, RI 02912	Project advisor (Philosophy)
Mr. Chris Mann Coommittee on Merchant Marine and Fisheries Gerald R. Ford House Office Building Second and D Streets, S.W. Washington, DC 20515	Congressional fellow (Public policy)
Mr. Victor T. Mastone Executive Office of Environmental Affairs 100 Cambridge Street, 20th Floor Boston, MA 02202	Project consultant (Archaeology)

Participant	Project Role (Discipline)
Dr. Anna McCann Apartment B-2104 200 East 66th Street New York, NY 10021	Visiting investigator (Archaeology)
Professor Bernard Oxman Dean University of Miami School of Law Coral Gables, FL 33124	Project advisor (Law)
Dr. David A. Ross Department of Geology & Geophysics Woods Hole Oceanographic Institution Woods Hole, MA 02543	Sea Grant Sponsor (Marine Geology)
Dr. Caroline Whitbeck Senior Lecturer in Mechanical Engineering Massachusetts Institute of Technology 3-158 Cambridge, MA 02139	Project consultant (Philosophy)
Prof. Alison Wylie* Department of Anthropology (visiting) University of California, Berkeley Berkeley, CA 94720	Project advisor (Philosophy)
Mr. Hongye Zhao Marine Policy Center Woods Hole Oceanographic Institution Woods Hole, MA 02543	Postdoctoral investigator (Law)

*(unable to attend session but contributed an abstract)

Appendix 3: **PLANNING MEETING AGENDA**

24 January 1992

Carriage House, Quissett Campus, WHOI, Woods Hole, Massachusetts

Introductions by Principal Investigators and Research Sponsors:

Dr. Robert Ballard (CME/WHOI)
Dr. James Broadus (MPC/WHOI)
Dr. David Gallo (IIR&D/WHOI)
Mr. Porter Hoagland (MPC/WHOI)

Mr. Noel Broadbent (NSF)
Dr. David Ross (NSGCP/WHOI)

Discussion of Research Issues:

<u>Archaeology</u>

Mr. Victor Mastone (BUAR/Mass.)
Dr. Anna McCann
Dr. Chris Hamilton (Whydah Joint Venture)
Dr. Ervan Garrison (NOAA)

<u>Technology</u>

Dr. Robert Ballard (CME/WHOI)
Dr. David Gallo (IIR&D/WHOI)

COFFEE BREAK

Discussion of Research Issues (cont'd):

<u>Markets</u>

Dr. James Broadus (MPC/WHOI)
Dr. Yoshi Kaoru (MPC/WHOI)

LUNCH BREAK

Discussion of Research Issues (cont'd):

Markets (cont'd)

Mr. Porter Hoagland (MPC/WHOI)

Law

Prof. Bernard Oxman (Univ. of Miami)
Mr. Arthur Cohn (Lake Champlain Mar. Mus.)
Mr. Hongye Zhao (MPC/WHOI)

Philosophy and Ethics

Dr. Caroline Whitbeck (MIT)
Prof. John Ladd (Brown Univ.)