

**Investigations into Block Island's Submerged Cultural Sites and Landscapes
for the Rhode Island Ocean Special Area Management Plan 2010**

by

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University of Rhode Island, June, 20, 2010

Extended Abstract

This report describes the cultural heritage research conducted to support the development of the Rhode Island Ocean Special Area Management Plan. The principle focus in this report is the state waters surrounding the southern end of Block Island that include the likely sites for Rhode Island first off shore renewable energy wind towers. While the research presented here was conducted under the umbrella of geophysical survey and mapping, the research design also incorporated archaeological survey and reconnaissance, and historical research that included a substantial secondary literature review and selected investigations of published and digitally available primary sources and archival research.

The project represents Rhode Island's first application of cultural landscape-based approach to the study and management of its marine cultural heritage. The cultural landscape approach recognizes that places and cultural heritage resources can have different or multiple meanings and levels of significance based on how people from different cultures, times, or backgrounds have interacted with the landscape. Adopting this broader pluralistic approach increases the likelihood that significant cultural heritage resources will be found *and* recognized.

The larger Ocean SAMP cultural heritage project identified several potential cultural landscape contexts. Among these contexts, two-fisheries and energy-have special significance for the study area. Fishing has taken place for millennia in this area and has exercised considerable direct effects on marine ecosystems and more recently on the content and condition of marine archaeological resources in Rhode Island waters. This report underscores the historical and cultural significance of fishing and identifies this landscape and its associated properties as particularly vulnerable to human impacts.

The quest for safe, reliable, and economical energy supplies has driven the Ocean SAMP process. This project revealed that energy has exercised dramatic and long-term effects on the local environment and on the composition of its archaeological landscapes. Historic shipwrecks associated with energy dominate in these waters. The drive to supply energy in industrial quantities to New England after 1850, led to hundreds of thousands of voyages through Rhode Island's outer waters and to the wrecking of many vessels. The report concludes that while posing potential threats to specific underwater resources, offshore renewable energy does not represent a completely new cultural landscape; rather it should be understand a part of this longer-term process of supplying New England domestic and industrial power.

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Abstract

This report describes the cultural heritage research conducted by the University of Rhode Island in support of the Ocean Special Area Management Plan (SAMP). This aspect of the project focused on the Rhode Island state waters adjacent to the Southern end of Block Island. The project revealed the presence of a rich and dynamic array of cultural heritage resources in the study area. This report highlights the cultural landscape approach, offers guidelines for applying federal historic preservation criteria to marine landscapes, and identifies specific landscape contexts and archaeological resources. The report also highlights the particular influence and resources associated with fisheries and energy as well as the long-term influence of military and conflict in shaping marine cultural heritage resources in Rhode Island.

1 Introduction

Rhode Island has an important maritime history inextricably linked to exploration, colonization, trade, shipbuilding, commerce, warfare, transportation, fishing and recreation. Almost four centuries of intense maritime activities in the region have left a rich repository shipwrecks and other cultural material in local waters. These resources contain vital and highly significant information about our nautical past, and are protected by a variety of state and federal laws and regulations. The presence of historically and archaeologically significant shipwrecks can affect development projects and is important to marine spatial planning.

Despite the undoubted abundance of cultural material in regional waters, the historical and archaeological significance of these resources, and the protection afforded to them by federal and state law, our understanding of the resources is very limited as is our capacity to protect them from salvage, climate change, or from potentially destructive competing uses of maritime space. Historic property resource managers and marine spatial planners need a combination of survey work, historical research, on-site investigations and a theoretical approach that contributes in significant ways to our understanding of cultural resources in Rhode Island waters and facilitates planning, protection and development. In preparing this report the authors employed this suite of tools under the theoretical umbrella of a Cultural Landscape Approach (CLA) to marine cultural heritage.

CLA differs from typical “site by site” paradigm that has been employed in the management of underwater cultural resources for the past three decades and that has only moved preservation of these resources forward in New England, including Rhode Island, in a limited fashion. Although recognizing and providing an enhanced framework for preservation, CLA operates at multiple geographic scales and thus allows for a fuller characterization of the content, significance, and condition of a particular area’s cultural heritage. It includes both the material and the intangible aspects of cultural heritage and relates them in a dialectical way with the conditions found in particular ecosystems as specific times. In short it embraces the mutually influencing relationships between nature and cultural and ties them to the condition of the environment and the content and meaning of its cultural heritage. Although the particular scope of this study did not allow all of the aspects of CLA to find a voice, these ideas or principals informed the entire effort.

2 Background - Cultural Landscapes as an Approach to Analyzing Heritage Resources

In Rhode Island, thousands of years of use of the ocean and its resources have resulted in rich and diverse array range of cultural resources underwater and in the coastal zone. These resources provide cultural, educational, recreational, environmental, and economic services that humans want and need. They are among the broader package of ecosystem services provided by the area encompassed within the Ocean SAMP. Submerged archaeological sites and landscapes are non-renewable—once gone they cannot be restored. The significance, sensitivity, and non-renewable nature of cultural and historic resources and the special services they provide make them a challenging and important aspect of the Ocean SAMP process.

Throughout the United States federal and states agencies, tribes, and the private sector are working to integrate cultural and heritage resources into Marine Spatial Planning (MSP). While legally specified historic preservation tools are being used to support marine spatial planning, most were developed to address terrestrial scales, environments, and issues. Addressing cultural heritage in MSP is a challenging task, one made more difficult by the lack of specialized knowledge on the part of most coastal planners. Another issue is the persistence of older historic preservation and cultural resource management paradigms that focus almost exclusively on the physical remains of single sites. Usually the sites that receive attention are historic shipwrecks of some local note. In historic preservation there are also traditions of thematic studies that look at specific human uses of particular places. Although valuable, these studies tend to look at a particular activity in relative isolation. In the case of Rhode Island, as we show in our study, and indeed in much of the United States, the vast majority of the resources remain unknown, or for management purposes, invisible because previously existing tools and the interpretations of law and policy do not capture them. CLA offers ways of integrating the important elements of site specific and human use theme studies not only with each other, but also with conditions found in the natural environment, including the health and composition of ecosystems. Through geographical representation and spatial analysis, interdisciplinary research, and multi-cultural interpretive frameworks, CLA makes visible the multiple connections between human and the natural environment in specific places and at different times. It offers one direction for meaningfully incorporating historical change into spatial analysis and coastal and marine planning and management. More than just a method of historical preservation, CLA offers ways to analyze historical patterns and relationships that relate directly to the use of ecosystem services and their effects on resiliency.

Whether characterized by historians, archaeologists, or cultural practitioners as districts, sites, buildings, objects, or landscapes, cultural heritage resources reflect millennia of human use of Block Island's marine and coastal environment. Submerged pre-contact tribal landscapes and historic shipwrecks, two of the most significant categories of cultural heritage, have no direct parallels on land and have the greatest untapped potential to add substantial knowledge about human activity on Block Island and surrounding waters (Little Red Book Section 220 B1). Cultural heritage contains ecological as well as cultural and historical information, and many resources have become integrated into marine ecosystems as habitat or as parts of the benthic environment. The cultural landscape approach directly recognizes dynamic relationships between nature and culture and allows for the inclusion of ecological significance in study and management.

The integration or blending of submerged cultural heritage resources and the natural environment make identifying many of these resources challenging. Covered by sediments or disguised by the rocks and boulders many of archaeological resources in the study area are difficult to discern even with specialized instrumentation. Their lack of visibility protects them from looting, but leaves them vulnerable to unintentional damage through human activities such as recreational boating, fishing, and construction. Larger modern shipwrecks are visible and many of them are important recreational sites as well as cultural heritage resources. Easily identified cultural heritage resources are vulnerable to looting by divers—a serious problem in the New England region.

Marine Spatial Planning for cultural resource requires a comprehensive understanding of the ocean landscape and its historic uses. The Rhode Island Historical Preservation and Heritage Commission employs a predictive model in evaluating the potential impact of projects on

archaeological sites on land in the coastal zone. Unfortunately, this model applies only to Native American sites, and not the historic cultural heritage resources that represent the majority of underwater cultural heritage. A pressing need exists to develop comparable tools including a complete sensitivity analysis in order to protect underwater cultural heritage in Rhode Island. The intensive work undertaken to survey and evaluate cultural heritage resources using cultural landscapes off the southern end of Block Island by SAMP investigators represents an initial step in developing the necessary tools.

2.1 Understanding Cultural Landscapes

Shipwrecks and other cultural materials deposited on the bottomlands and along the shore can be mapped and evaluated as a series of cultural landscapes that reflect distinct (though often overlapping) historical contexts and cultural orientations (Anschuetz et. al., citing Binford, 1983, 380). Cultural landscapes contain both material and symbolic elements, but key for archaeologists, historians, and preservationists is that cultural landscapes reflect patterned human behavior that one can analyze, interpret and preserve. The study of maritime cultural landscapes has great potential for yielding archaeological, historical, and cultural information about the study area and the places adjacent to it. Depending upon the question or resource type being considered, applying the landscape framework can encompass and, when required transcend, political, ethnic, geographic, and cultural boundaries and contribute to a more holistic management regime (Cameron and Rossler, 1995). Applying the cultural landscape framework to the study area's submerged cultural resources leads to the asking of historical and anthropological questions that encompass and transcend state and local boundaries. This allows the significance of cultural heritage resources of the study area to be evaluated in light of regional, national and international processes (Cameron and Rossler, 1995).

Although tied to quantifiable material cultural such as shipwrecks, marine-related objects, and patterns of geographical dispersion, the cultural landscape framework encourages the asking of broader theoretical questions. For example, how did the early Indian or European explorers "see" and experience these waters and surrounding landforms? How did their Block Islanders perceptions of the local marine environment influence the design of the watercraft they built and the ways in which they operated them? In what ways did the industrialization of New England during 19th century affect the natural environment and the composition of its maritime archaeological resources? In what ways did changes in the organization and technologies of fishing effect marine environments and local communities? Did specific ethnic or cultural identities affect maritime or environmental strategies or behaviors? Carefully designed archaeological projects examining Rhode Islands shipwrecks and associated cultural materials can help to answer these and other broad questions, but only when isolated events and individual sites are approached through an integrating paradigm such as the cultural landscape (Fry, 2001, p. 240).

The southern Block Island sector of the SAMP area has known shipwrecks with associated with military, commercial shipping, energy, and fisheries landscapes, most dating from the nineteenth and twentieth centuries. Much older highly significant shipwrecks associated with exploration, early fishing, and commerce almost certainly exist, but are not documented in historical records. In a similar vein, local builders produced uncounted numbers of small vernacular craft including fishing boats that escaped historical documentation. Further removed in time, pre-contact Indian landscapes existed and may still survive in some form and the area. With or without the presence of material culture these submerged landscapes retain meaning for Rhode Island's Indian people. Without careful evaluation at the landscape level, proposed and current economic activities in the SAMP study area pose serious threats to these important but often undocumented resources.

Defining an archaeological resource as part of a cultural landscape does not enforce a hegemonic, theoretical or cultural valuation. As Anschuetz et. al., note on the application of cultural landscapes to archaeology, “a landscape paradigm offers the potential to accommodate, if not integrate, different theoretical perspectives even while these constructs seemingly exist in tension with one another in their presentation of alternative constructions of the past”(Anschuetz, et. al., 20). Employing a cultural landscape framework allows for the documenting and preservation of historical and archaeological resources while leaving open the interpretation of significance to multiple cultural and theoretical perspectives (Howett, 2000, p. 206-7).

As the editors of the recent volume *Preserving Cultural Landscapes in America* noted “the vast majority of cultural landscapes . . . generally evolve unintentionally and represent multiple layers of time and cultural activity” (Alanen and Melnick, 2000, p. 5). Cultural landscapes are discrete physical places, and a way of organizing and analyzing the relationship between culture and nature wherever the two intersect and leave a material or cultural imprint on the land. Off the southern end of Block Island as elsewhere, culture landscapes are largely unintentional products of human activity. Layered by time and shifts in human behavior, cultural landscapes represent changing relationships between humankind and the environment, as well as major historical or cultural events or processes.

2.2 The National Register of Historic Places and Maritime Cultural Landscapes

Beyond their usefulness in interpreting cultural heritage, cultural landscapes are a property type recognized by the National Register of Historic Places. The National Park Service sets the criteria for the Register and defines a cultural landscape as “a geographical area, including both natural and cultural resources, associated with a historic event, activity, or person” (Egan, 2003, p. 259). NPS recognizes four categories of cultural landscapes, included among these are historic vernacular landscapes that “evolved through use by people whose activities or occupancy shaped the landscape. Through social or cultural attitudes on an individual, family or a community, the landscape reflects the physical, biological, and cultural character of those everyday lives” (Birnbaum, 1994). Vernacular landscapes exist in rural, suburban, and urban areas; however, those mostly commonly recognized by the NPS are the rural historic landscapes (Egan 2003, 259).

National Register Bulletin 30, Guidelines for Evaluating Rural Historic Landscapes defines a rural historic landscape as: “a geographical area that historically has been used by people, or shaped or modified by human activity, occupancy, or intervention, and that possess a significant concentration, linkage or continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and natural features” (McClelland, Keller, Keller, and Melnick, 1990 - hereafter referred to as *NPS Bulletin 30*). Included among the normative types of rural landscape are those associated with “maritime activities such as fishing,” “transportation systems,” and “migration trails.”

2.3 Applying National Register Historic Landscape Characteristics to the Southern Block Island Study Area.

National Register Bulletin 30 evaluates the eligibility of rural historic landscapes for the National Register using eleven categories: four land shaping processes and seven physical components visible on the land. These categories and their maritime applications are treated

individually in the paragraphs that follow. Those interested in a closer examination of these characteristics are directed to *NPS Bulletin 30*.

The discussions that follow below offers guidance in applying National Register criteria for landscapes to cultural and natural resources within the study area. They also bring into relief the broader composition of these landscapes and offer additional examples of the study area's potential archaeological and historical resources.

2.4 Rural Historic Landscape Characteristics

Processes:

Land Uses and Activities

Patterns of Spatial Organization

Response to the Natural Environment

Cultural Traditions

Components:

Circulation Networks

Boundary Demarcations

Vegetation Related to Land Use

Buildings, Structures, and Objects

Clusters

Archaeological Sites

Small Scale Elements

2.4.1 Land Uses and Activities

“An examination of changing and continuing land uses may lead to a general understanding of how people have interacted with their environment and provide clues about the kinds of physical features and historic properties that should be present.” (NPS Bulletin 30)

Landscapes are not static; they form spaces on which cultures imprint ideas, practices, and values through alterations in the land, symbolic or spiritual valuation, and by depositing material culture. The identification of discrete patterns of material culture visible on the land may reflect continuing and changing uses, the adoption of new technologies, the influence of ethnic traditions, and other natural and cultural factors. Over the centuries in maritime Rhode Island, discrete economic and ecological niches opened and closed, sometimes quite rapidly, different political or cultural groups with differing values controlled allocations of natural resources, power, or space. These discrete cultural niches or processes have left distinct signatures on the landscape and in the historic record associated with Block Island.

Southern Block Island adjacent to high traffic zones characterized in places by dangerous rocks and shoals, unpredictable currents, and a tendency for dense fog, squalls, and in the winter heavy snow. Exposed to the fury of the Atlantic Ocean, this high-energy environment is characterized by intermittent high seas and ever-present dangerous shores. Shipwrecks and associated terrestrial maritime landscape features such as lighthouses, lifesaving stations, aids to navigation, and harbors of refuge all record how people thought about, used, responded to, and altered the maritime and coastal environment on or near Block Island.

2.4.2 Patterns of Spatial Organization

“The organization of land on a large scale depends upon the relationship among major physical components, predominant landforms, and natural features. Politics, economics, and technology, as well as the natural environment, have influenced the organization of communities by determining settlement patterns, proximity to markets, and the availability of transportation.” (NPS Bulletin 30)

The spatial organization of the settled land reflects a combination of social and natural factors. For example, politics, major landforms, and proximity to markets influence the locations and success of communities, the development of roads, and systems of property. This extends into the study area through maritime corridors, the placement of harbors at Block Island, Point Judith, and Newport, the locations of fishing grounds. The spatial organization of the cultural landscape also reveals the study area’s place and influence in regional, national, and international maritime transportation networks.

Economics influence the historical and geographical distributions of shipwrecks. Transportation economics and the small margins associated with industrial shipping forced shipping lines to search for the shortest or least expensive routes between places. The principal routes used by steam and sailing vessels approaching or passing southern Block Island are documented in contemporary published coast pilots, marked on navigation charts, miscellaneous transportation maps, in the placement of lighthouses and other aids to navigation, and in clusters of wrecked vessels on the edges of Block Island.

2.4.3 Response to the Natural Environment

“Major natural features . . . influenced both the location and organization of rural communities. Climate, similarly, influenced the siting of buildings, construction materials, and the location of clusters of buildings and structures. Traditions in land use, construction methods, and social customs commonly evolved as people responded to the physiography and ecological systems of the area where they settled.”(NPS Bulletin 30)

While the NPS rural landscape guide focuses on *settlement* patterns in describing responses to the natural environment, in a maritime transportation corridor, the fundamental patterns and features reflect the *movement* of vessels as well as the siting of maritime buildings and structures. In addition, in marine archaeology a ship is considered as a mobile “site” of human behavior.

Archaeological resources reveal complex human responses to the natural environment. Environmental factors such as water depth, prevailing wind patterns, and the availability of native building material influenced the designs of and construction methods used in building generations of local vessels such as the famed Block Island double ended fishing boats.

The density of and types of wrecks in the study area has the potential to reveal much about the influence of natural and market forces on the operation of ships and boats in Rhode Island. Evolving regional economic geography influenced physical parameters for vessels governing their size, influencing hull designs, and, where applicable, sailing rigs. This was true in the late nineteenth century when shippers turned to the schooner-barge (a cargo vessel with a simple auxiliary sailing rig tow by a steamer) to carry coals from Virginia, Delaware, and Pennsylvania to the New England’s grown cities and mills. It has remained equally true in the later 20th and

early 21st century and is expressed in the types and wrecking patterns of the region's commercial fishing vessels. Politics, the economy, cultural traditions, and the availability of building materials affected the designs, quality, use, and loss of ships and boats in the study area. These broader issues, once again, call for an evaluation that includes the landscape along with the study of individual sites.

2.4.4 Cultural Traditions

“Cultural traditions affect the ways the land is used, occupied, and shaped.” (NPS Bulletin 30).

Indian efforts to shape New England's ecosystems before European contact and settlement are well documented (Cronon 1982). The cultural traditions and practices of Atlantic mariners and certainly of Rhode Island's Indian and non-Indian fishermen are also written into the cultural landscape. The choice of species hunted, methods employed, and systems for allocating of space and natural resources, are all cultural elements that shaped and continue to influence the ecology and cultural landscape of Block Island. The cultivation of oysters, the use and location of fish traps and weirs, are just two examples of this category. Perhaps even more important are the spiritual meaning and uses of the landscape by Indian people.

2.4.5 Circulation Networks

“Circulation networks are systems for transporting people, goods, and raw materials from one point to another. They range in scale from livestock trails and footpaths, to roads, canals, major highways, and even airstrips. Some, such as farm or lumbering roads, internally served a rural community, while others, such as railroads and waterways, connected it to the surrounding region.”(NPS Bulletin 30).

The survey area includes corridor segments of a nationally significant circulation system that helped define the cultural and economic character of the Northeastern United States from the time of European exploration into the early 20th century. Corridors are distinct linear features within circulation systems that facilitate the movement of people, materials, energy, biota, and ideas between places. The waters adjacent to Block Island were part of a larger transportation network that facilitated the low cost and rapid transfer of people and natural resources including wood, food, and sources of energy in New England. As a recent scholar of archaeology and cultural landscapes noted, “an important research theme is the way transport infrastructure and modes of transport affect our concepts of place and space” (Fry, 2001, 241-242). Maritime cultural landscapes offer frameworks for understanding place and space on Block and Rhode Island Sounds as they relates to culture and environment of rural and urban areas. The content and intensity of the maritime connections between places is documented in the copious surviving federal records, such as the lighthouse keepers who documented the daily passage of hundreds of tall ships. Shipwrecks and navigation system-related objects, sites, structures, and buildings provide physical evidence of this historically significant circulation system.

2.4.6 Boundary Demarcations

“Boundary demarcations delineate areas of ownership and land use . . . they also separate smaller areas having special functions. Fences, walls, tree lines, hedge rows, drainage or irrigation ditches, roadways, creeks, and rivers commonly marked historic boundaries.”(NPS

Bulletin 30).

Boundary demarcations offer one of the most challenging aspects of defining maritime landscapes according to National Register standards. The lack of clearly established boundaries, however, failed to prevent the determination of Nantucket Sound as a cultural landscape eligible for the National Register of Historic Places. The physical boundary demarcations listed in *NPS Bulletin 30* were not developed for marine spatial planning or maritime preservation. However, the depth contours, marked navigation channels, lighthouses and buoys, and harbors of refuge can provide boundary demarcations that accurately reflect the patterned uses of the Rhode Islands' waterways. The SAMP itself represents an effort to establish cultural boundaries that will directly affect the physical patterns and cultural markings of future uses.

2.4.7 Vegetation Related to Land Use

The characteristic "vegetation" may apply to the SAMP areas maritime landscapes through patterned alteration to shoreline plant life such as include eelgrasses or other species affected by development or the gathering of kelp. A different application of the vegetation characteristic involves the long-term use of peat for fuel by Block Islanders. The extensive extraction of peat left discernable physical signatures on the coastal and underwater landscape, the extent of which is currently unknown. This important but rarely recognized activity influenced the ecosystem, landscape, and life ways of people who lived in the study area. Vegetation patterns can be important markers within the archaeological record for connecting human uses of the study area with the condition and composition of the ecosystem. It may be possible to broaden vegetation category to also incorporate biology, such as the deliberate introduction of non-native species, or the introduction of invasive species by ocean going vessels passing through or wrecking in Rhode Island waters. The archaeological remains of shipwrecks and other cultural landscape features have a strong potential for adding significant ecological information about Block Island and surrounding waters.

2.4.8 Buildings, Structures, and Objects

"Various types of buildings, structures, and objects serve human needs related to the occupation and use of the land. Their function, materials, date, condition, construction methods, and location reflect the historic activities, customs, tastes, and skills of the people who built and used them." (NPS Bulletin 30)

According to National Park Service definitions ships, canals, bridges, docks, and breakwaters are structures. Many ships ply the survey area today and continue with the historic activities such as of carrying passengers or fuel in the form of coal and petrochemicals. Commercial fishing vessels from Rhode Island and beyond continue to work these historic grounds. Fishing vessels are working mobile structures that contribute to the cultural landscape's historical integrity by evoking the historic feeling and character of Rhode Island's maritime economy. Many of the fishing vessels working in Rhode Island today will someday be eligible for the National Register either has historic ships or as archaeological sites, and those older than fifty years are already potentially eligible (Delgado, 1992). Even many of the newer vessels plying out of Point Judith and New England ports possess esthetic values consistent with ships built during late nineteenth and early decades of the 20th century. Given the current challenges facing Rhode Island commercial fishermen, attention to the structures associated with the fisheries cultural landscape seems both important and urgent.

Rhode Island's bottomlands are scattered with historic objects: anchors, jettisoned cargo, refuse, industrial and military equipment in the form of munitions, aircraft, and miscellaneous discarded goods. There are also a vast number of disarticulated architectural features from ships: rudders, major timbers, and parts of sides, bottoms, and decks. The cultural landscape framework facilitates the evaluation and management of these broad archaeological mosaics and offers ways through GIS mapping and reporting to monitor cumulative natural and human impacts on cultural and historic resources.

2.4.9 Clusters

“Groupings of building, fences, and other features, as seen in a farmstead, ranch, or mining complex, result from function, social tradition, climate, or other influences, cultural or natural. The arrangement of clusters may reveal information about historical and continuing activities, as well as the impact of varying technologies and the preferences of particular generations. . . . Also, the location of clusters, such as the market towns that emerged at the crossroads of early highways, may reflect broad patterns of a region's cultural geography.” (NPS Bulletin 30)

The landscape characteristic of “cluster” applies directly to maritime cultural landscapes. Determining the spatial patterns of archaeological resources requires carefully designed studies. The survey of the southern Block Island portions of the study area conducted by SAMP research revealed a patterned cluster of shipwrecks. The density of sites is greater where human and natural factors combine to create dangerous conditions. Dozens of sailing vessels were damaged or destroyed by going aground on Block Island. The locations of clusters of archaeological sites and objects and their association with ports and particular trades “reflect broad patterns of [the] region's cultural geography” (*NPS Bulletin 30*). Identifying such clusters is critical for preserving cultural landscapes while also encouraging the sustainable economic uses of the ocean. Clusters of abandoned and wrecked ships from the late nineteenth and early twentieth century similar to those on the edges of Block Island are on the National Register of Historic Places as individual sites and as part of archaeological districts.

2.4.10 Archaeological Sites and Small Scale Elements

[Archaeological sites] “may provide valuable information about the ways the land has been used, patterns of social history, or the methods and extent of activities such as shipping, milling, lumbering, or quarrying. The ruins of mills, charcoal kilns, canals, outbuildings, piers, quarries, and mines commonly indicate previous uses of the land . . . The spatial distribution of features, surface disturbances, subsurface remains, patterns of soil erosion and deposition, and soil composition may also yield information about the evolution and past uses of the land.”

“Small-scale elements . . . add to the historic setting of a rural landscape. These features may be characteristic of a region and may occur repeatedly throughout a region Collectively, they often form larger components, such as circulation networks or boundary demarcations. Small-scale elements also include minor remnants—such as canal stones, road traces, mill stones, individual fruit trees, abandoned machinery, or fence posts—that mark the location of historic activities, but lack significance or integrity as archaeological sites.” (NPS Bulletin 30)

Archaeological sites and small-scale elements are the principle features marking Rhode

Island's historic navigation corridors. Small-scale elements may include the only remaining physical trace remaining of culturally significant tribal cultural landscapes. Remnants of human activity can provide the most comprehensive material record of the evolving human use of Rhode Island's Ocean resources. The historic uses of local waterways included more than transportation or fishing. The waters served as a testing grounds for military equipment, a sink for sewage, a trash dump, a scientific laboratory, a recreational zone, and as an aesthetic vista and spiritual place. These activities affect ecosystems and cultures and yet management of marine resources tend to overlook their historical and cultural significance. By adopting the landscape paradigm, scholars and resource managers can create aggregates out of individual sites and small-scale elements and identify additional, perhaps yet unseen but significant patterns of use and cultural meaning. These fine grain approaches to cultural resources are not restricted to preservation. Managers can use them to identify past, current, and potential environmental threats to Rhode Island's marine ecosystems.

2.5 GIS and Marine Spatial Planning for Historical and Cultural Resources.

Modern methods of spatial analysis powered by GIS systems have the potential to revolutionize the management of Rhode Island's marine cultural resources. For decades archaeologists and cultural resource managers routinely dismiss single object artifacts as isolated finds that lack archaeological context. Today this is not longer true. An isolated anchor from a historic schooner or a pre-contact stone tool trawled up by a commercial fisherman may seem to have little significance or historic integrity on its own, but as a quantifiable item in a cultural landscape map it will contribute to the broader understanding the human use of Rhode Island's marine environment. Similarly, the analysis of items once dismissed as isolated beach wreckage will, when tracked as part of a cultural landscape GIS, lead to a greater understanding of the physical dynamics governing the preservation of submerged resources. Furthermore, small durable sections of ship wreckage such as rudders, frames, pieces of bilges and sides, or machinery, while lacking sufficient individual integrity to qualify as a National Register eligible archaeological site take on new value when analyzed against the area's broader cultural landscape. Given the huge geographical spaces involved and the complexity and expense of marine archaeological surveys, a shift towards a GIS-powered cultural landscape approach will support the development the model, sensitivity analysis, and practical plans needed to manage Rhode Island's submerged and marine cultural resources during an era of expanding economic opportunities of our shores.

3 Methods

3.1 Secondary Sources, Published Material and Literature Review

A wide variety of newspaper databases were consulted in the effort to expand our knowledge of vessel losses in the Ocean SAMP area. The Newspaper Archive (Newspaper Archive.com) allowed for a good, if opportunistic, examination of regional newspapers. The archive has a national cross-section of second tier papers that tend to catch any wrecks or incidents that had more than local coverage. Particularly useful in the archive was an incomplete but extensive run of the *Newport Daily News* (1846–1977).

Additional local coverage came from the card index and microfilm runs from the *Providence Journal* located at the Providence Public Library. Web-based databases and editions of the *New York Times* and the *Brooklyn Daily Eagle* provided a useful New York perspective.

Extensive use was made of the online U.S. Serial Set and Serial Set Map databases. They provided in depth coverage of congressional publications that provided comprehensive statistics, congressional hearings, and annual agency reports.

Further information about published sources and databases can be found in section 3.4 below.

3.2 Archival Research

Historians working for the Ocean SAMP study conducted archival research at the Regional National Archives in Waltham, Massachusetts. That research comprised three separate research trips. On each occasion, historians examined, copied and photographed records kept by federal agencies. A major focus was to evaluate records at the local level in order to identify shipwrecks and other cultural elements that were not considered of sufficient importance to include in published reports.

3.2.1 Submarine Cable Research

The following record records were consulted for research on submarine cables in the Ocean SAMP area. This line of inquiry was triggered by questions and concerns over a cable area to the southwest of Block Island.

Submarine Communication Cables - Narragansett, RI - [Project #] D-RI-423, 1956 - 1957
ARC Identifier 1272264

Textual Records from the General Services Administration. Public Buildings Service. Region 1. (12/11/1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 121: Records of the Public Buildings Service, 1801 – 2000

Bonnett Shore - Subterranean cable easements - Narragansett, RI, 1957 - 1957

ARC Identifier 660245

Textual Records from the General Services Administration. Region 1. Real Property Division. (ca. 1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 269: General Records of the General Services Administration, 1922 – 1997

Real Property Disposal Case Files, *compiled ca. 1949 - ca. 1976, documenting the period ca. 1939 - ca. 1976*

ARC Identifier 1155019

Textual Records from the General Services Administration. Public Buildings Service. Region 1. (12/11/1949 -)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 121: Records of the Public Buildings Service, 1801 – 2000

Real Property Disposal Case Files, *compiled 1949 - ca. 1987, documenting the period 1946 - ca. 1987*

ARC Identifier 607931

Textual Records from the General Services Administration. Region 1. Real Property Division.

(ca. 1949 -)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 269: General Records of the General Services Administration, 1922 – 1997

Subterranean Cable Easements - Block Island, RI, 1956 - 1960

ARC Identifier 1272266

Textual Records from the General Services Administration. Public Buildings Service. Region 1. (12/11/1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 121: Records of the Public Buildings Service, 1801 – 2000

Block Island (portion) - Subterranean cable easements - Narragansett, RI, 1957 - 1958

ARC Identifier 660246

Textual Records from the General Services Administration. Region 1. Real Property Division. (ca. 1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 269: General Records of the General Services Administration, 1922 - 1997

Green Hill Fire Control Station - subterranean cable - South Kingston, RI - [Project #] D-RI-415, 1944 - 1958

ARC Identifier 1272032

Textual Records from the General Services Administration. Public Buildings Service. Region 1. (12/11/1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 121: Records of the Public Buildings Service, 1801 – 2000

Naval Base - telephone cable system - Newport, RI - [Project #] N-RI-427, 1957 - 1957

ARC Identifier 1272137

Textual Records from the General Services Administration. Public Buildings Service. Region 1. (12/11/1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 121: Records of the Public Buildings Service, 1801 – 2000

Green Hill - Subterranean cable easements - South Kingston, RI, 1958 - 1958

ARC Identifier 660257

Textual Records from the General Services Administration. Region 1. Real Property Division. (ca. 1949 -)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 269: General Records of the General Services Administration, 1922 – 1997

3.2.2 Shipwreck Research

The following records were consulted in an attempt to expand our understanding of shipwreck losses in the Ocean SAMP area.

Wreck Reports for Sandy Point Lifesaving Station, 1899 - 1916

ARC Identifier 648090

Textual Records from the Department of the Treasury. U.S. Coast Guard. Eastern Division. (1915 - 1933)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Fog Signal Logbooks, *compiled 1891 - 1945*

ARC Identifier 1256995

Textual Records from the Department of the Treasury. U.S. Coast Guard. Beavertail Light Station, Jamestown, Rhode Island. (07/01/1939 - 04/01/1967)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Records of Passing Vessels, *compiled 1880 - 1894*

ARC Identifier 1257003

Textual Records from the Department of the Treasury. Lighthouse Board. Beavertail Light Station, Jamestown, Rhode Island. (10/09/1852 - 1903)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Journals of Shipwrecks, *compiled 1856 - 1927*

ARC Identifier 645541

Textual Records from the Department of Commerce. Bureau of Lighthouses. (1913 - 07/01/1939)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Lifesaving Station Logs, *compiled 1872 - 1942*

ARC Identifier 645099

Textual Records from the Department of the Treasury. U.S. Coast Guard. Boston Coast Guard District. (06/20/1939 - ca. 1944)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Wreck Reports for Point Judith Lifesaving Station, *1903 - 1919*

ARC Identifier 648089

Textual Records from the Department of the Treasury. U.S. Coast Guard. Eastern Division. (1915 - 1933)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Wreck Reports for Watch Hill Lifesaving Station, *1907 - 1907*

ARC Identifier 648091

Textual Records from the Department of the Treasury. U.S. Coast Guard. Eastern Division. (1915 - 1933)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 26: Records of the U.S. Coast Guard, 1785 - 2005

Wreck Reports for Narragansett Pier Lifesaving Station, *1905 - 1918*

ARC Identifier 648088

Textual Records from the Department of the Treasury. U.S. Coast Guard. Eastern Division. (1915 - 1933)

NARA's Northeast Region (Boston), Waltham, MA

File Unit from Record Group 26: Records of the U.S. Coast Guard, 1785 – 2005

Wreck and Obstruction Files, *compiled 1942 - 1979*

ARC Identifier 1756157

Textual Records from the Department of Defense. Department of the Army. U.S. Army Corps of Engineers. North Atlantic Division. U.S. Army Engineer District, New England. (06/14/1979 -)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 77: Records of the Office of the Chief of Engineers, 1789 – 1999

Wreck Reports, *compiled 1877 - 1909*

ARC Identifier 645703

Textual Records from the Department of the Treasury. Customs Service. Collection District of Bristol and Warren, Rhode Island. Office of the Collector of Customs. (02/25/1801 - 1913)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 36: Records of the U.S. Customs Service, 1745 – 1997

Wreck Reports, *compiled 1911 - 1963*

ARC Identifier 645702

Textual Records from the Department of the Treasury. Bureau of Customs. Collection District of Rhode Island. Office of the Collector of Customs. (1927 - 1973)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 36: Records of the U.S. Customs Service, 1745 – 1997

Wreck Reports, *compiled 1873 - 1874*

ARC Identifier 645701

Textual Records from the Department of the Treasury. Customs Service. Collection District of Newport, Rhode Island. Office of the Collector of Customs. (06/14/1790 - 1913)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 36: Records of the U.S. Customs Service, 1745 – 1997

Wreck Reports, *compiled 1874 - 1954*

ARC Identifier 1105543

Textual Records from the Department of the Treasury. Bureau of Customs. Collection District of Rhode Island. Office of the Collector of Customs. (1927 - 1973)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 26: Records of the U.S. Coast Guard, 1785 – 2005

General Records Relating to Lighthouses, *compiled 06/1792 - 1870*

ARC Identifier 2022360

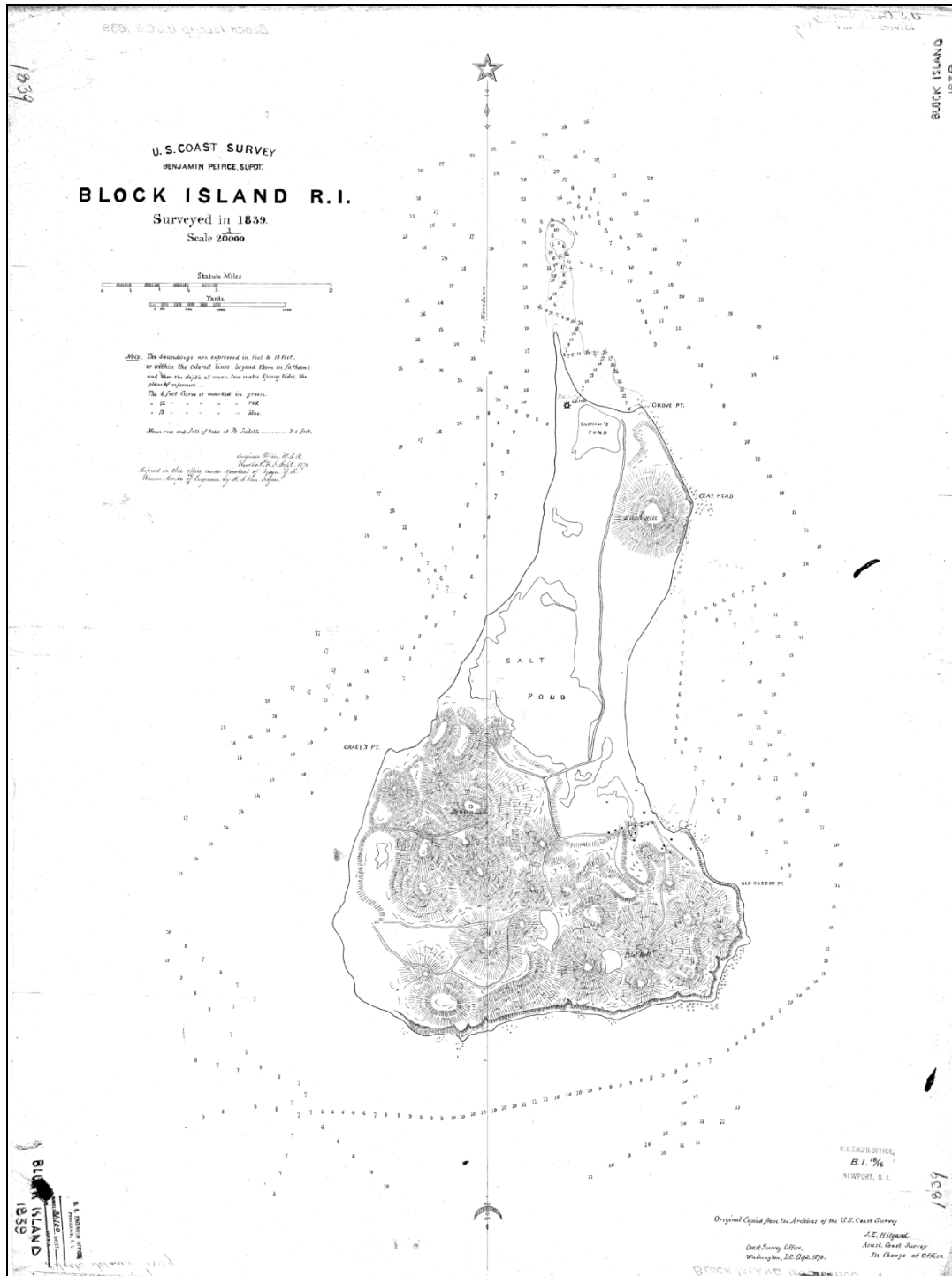
Textual Records from the Department of the Treasury. Customs Service. Collection District of Newport, Rhode Island. Office of the Collector of Customs. (06/14/1790 - 1913)

NARA's Northeast Region (Boston), Waltham, MA

Series from Record Group 26: Records of the U.S. Coast Guard, 1785 – 2005

3.3 Historic Cartographic Research

Figure 1. First Hydrographic Survey of Block Island, 1839.



The historic cartographic research to support this study focused on geo-rectifying historic navigation charts for Block Island. The charts for 1914, 1934, 1957, 1966, 1968, 1970, 1971, 1972, 1973, 1975, 1977, 1978, 1985, 1996, 1997, and 1999 were geo-referenced and laid on top of the modern navigation chart. A similar procedure with navigational charts for Block Island Sound was followed, although in this case the process was less exhaustive. It did, however,

incorporate data from the 1901 navigation chart of Block Island Sound which in turn is based on survey data from 1848. URI researchers also geo-rectified 1934 and 1999 charts of the Block Island Sound. In the process of doing this work they identified what was almost certainly the first modern hydrographic survey of Block Island waters – completed by the US Coast Survey in 1839 (Figure 1). From these charts, researchers were able to map historic navigation corridors, hazards to navigation, obstructions, shipwrecks, shoaling, shoreline changes and patterns of maritime commerce. That data is currently being incorporated into a GIS database.

3.4 Database Development

Data related to shipwreck losses in the Ocean SAMP area comes in multiple forms. Prior to this project, the most reliable database of shipwrecks was maintained by the Rhode Island State Historic Preservation and Heritage Commission (the Official State Database), which contained listings for 1041 shipwrecks in Rhode Island state waters. The Official State Database also includes significant information collected over many years by the Rhode Island Marine Archaeology Project (RIMAP) headed by Dr. Kathy Abbass. Two additional databases complement the one held by the state. First, the Northern Shipwrecks Database, comprising in excess of 100,000 shipwrecks, has at least 1200 recorded in Rhode Island waters. Second, the National Oceanographic and Atmospheric Administration’s Office of Coast Survey maintains the Automated Wreck and Obstruction Information System (AWOIS) that has 850 wrecks and obstructions for a region (Region 2) that extends from Long Island Sound to Cape Cod and includes Rhode Island waters.

The University of Rhode Island has developed three databases, all of which were augmented as a result of the Ocean SAMP study; a working archaeological database with 618 shipwrecks in Rhode Island waters (URI Working Database); a geophysical survey database containing acoustic images of at least 30 shipwrecks in Rhode Island (URI Geophysical Survey Database); and a supplementary historic database, built from various sources including historic charts, records of the US Life Saving Service, the US Coast Guard, the Navy and the Department of Commerce (URI Supplementary Historic Database). The URI Supplementary Historic Database currently contains listings for 584 wrecking events that occurred in Rhode Island prior to 1908 as well as considerable information about non-shipwreck submerged cultural resources. Archival research conducted as part of the Ocean SAMP helped build and refine this database.

All databases described above can be augmented with published dive guides - the most important of which are Marlene and Don Snyder’s books *Rhode Island Adventure Diving* and *Rhode Island Adventure Diving II*; and Henry Keatts and George Farr’s book, *The Bell Tolls: Shipwrecks & Lighthouses, Volume 1, Block Island*.

Outside government agencies, organized avocational groups, and academic institutions many individual people including fishermen, divers, and amateur historians possess critical information about shipwrecks and other submerged archaeological sites in Rhode Island. Selective use from these sources informed the study, but more systematic research is contemplated in future studies.

All of these databases and sources of information have strengths and weaknesses. While there is considerable overlap, there are also significant discrepancies between the datasets. As part of the SAMP process, researchers at the University of Rhode Island started to augment the Official State Database with extensive data from elsewhere. Although still not complete, the

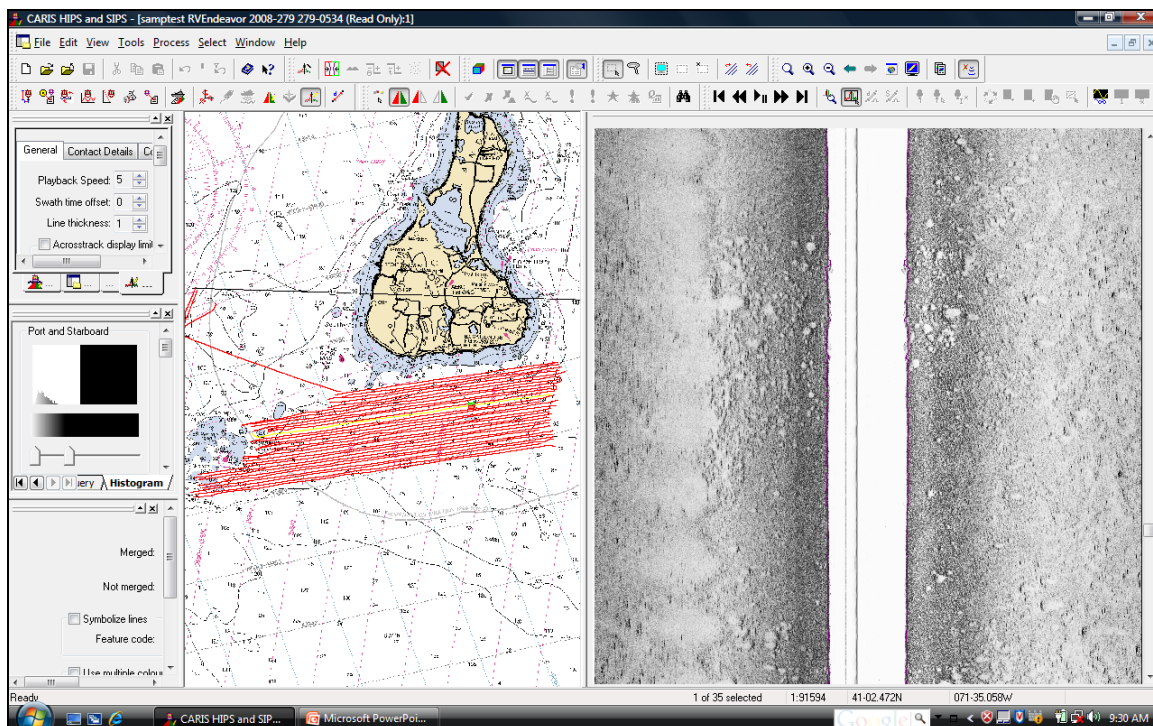
final rationalized product will be an improved estimate of the location and extent of submerged cultural resources in the Ocean SAMP area.

3.5 Geophysical Data Analysis

Funding limitations and budget reductions prevented comprehensive cultural resource analysis of geophysical data collected as part of the Ocean SAMP studies. As a result, URI archaeologists were only asked to complete analysis of data from the 2008 *Endeavor* cruise. This cruise covered approximately 25 square miles to the south and west of Block Island out to approximately the 3-mile demarcation of state waters. Using CARIS acoustic data processing software, each line of side scan sonar data from the 2008 *Endeavor* cruise was examined for potential cultural resources (Figure 2). Researchers then classified each target in accordance with a 5-point scale.

1. Certain – the acoustic data alone made it possible to identify the target as a shipwreck or other cultural resource.
2. Probable – the acoustic data was highly suggestive of cultural resources, containing features such as linearity and regular patterning that are commonly associated with shipwrecks or other cultural resources.
3. Possible – the acoustic data has some features that have been reliably associated with cultural resources but might also be indicative of features in the natural world.
4. Unlikely – the acoustic data has features that are normally associated with the natural environment, but may have some features that show regularity and could be cultural in origin.
5. Conceivable – the acoustic data is almost certainly associated with features in the natural world, but could conceivably be cultural in origin.

Figure 2. Post Processing *Endeavor* Cruise Side Scan Sonar Data and Target Identification



Researchers then developed a table containing each target, its location, a description and classification. Through this process, targets with acoustic signatures that were indicative of submerged cultural resources were identified and prioritized for groundtruthing (on-site investigation and study).

3.6 Site Specific Investigations

3.6.1 Coastal Pedestrian Survey

While coastal and onshore cultural resources were not the focus of this part of the Ocean SAMP studies, researchers did complete a preliminary cultural resources pedestrian survey of the southeastern coast of Block Island. At evenly spaced intervals (3 m), researchers walked the shore recording and photographing cultural material. The data was organized into an image library and is available upon request. The following points delineated the extents of the survey:

Eastern end of Pedestrian Archaeological Survey: 41 09.442N; 71 32.704W

Western end of Pedestrian Archaeological Survey: 41 09.095N; 71 33.405W

3.6.2 Underwater Site Studies

The investigation of underwater archaeological resources was the primary focus of on-site investigations for this part of the Ocean SAMP study. Fieldwork comprised two 4-day expeditions to Block Island, one from June 16-20, 2009 and the other from August 24-28, 2009. On each occasion, we used the R/V *Hope Hudner* – a 38-foot, fiberglass former lobster boat owned by the University of Rhode Island. The *Hudner* is well appointed for survey work and dive operations. For the second trip we also used a 26' inboard/outboard support boat – the RB-1. Personnel for the June 2009 expedition were Rod Mather, John Jensen, Mark Gustafson and Matt Horn. Personnel for the August 2009 expedition were Rod Mather, John Jensen, Mark Gustafson, Jamin Wells and Abigail Howe.

The SAMP research confirmed the large potential scope for archaeological investigations off Block Island. A full investigation would comprise many months, possibly multiple years, of fieldwork. Since that was neither practical nor funded, the object of on-site investigations was to conduct archaeological assessments of 2-3 representative known sites and to groundtruth a similar number of side scan sonar targets from the 2008 *Endeavor* survey. In addition, the archaeological side scan sonar research plan including a survey close to the southern shore of Block Island up to the 10-foot contour, water much too shallow for survey by the R/V *Endeavor*.

Overall, the purposes of side scan sonar work associated with this part of the Ocean SAMP study were:

1. To reacquire targets identified during post-processing of the *Endeavor* 2008 data. This was important both to confirm the target's presence and establish locations for dive operations.
2. To investigate reported locations of shipwreck sites close to but outside the coverage of *Endeavor*.
3. To complete side scan sonar survey work inside the coverage of the *Endeavor* (as described above). This was particularly important as multiple shipwrecks are known to have gone ashore along the southern coast of Block Island. Of these, five were

particularly important; the *Meteor*, the *USS Leydon*, the *Essex*, and *Lightburne* and the *Spartan*.

The side scan sonar at our disposal was an Edgetech 272, 100 kHz towfish. The survey was controlled using a Furuno DGPS and HYPACK hydrographic survey software. The towfish was deployed by hand and towed at an altitude of 10% of the swath width. Sonar data was acquired using Chesapeake Technology SonarWiz software. Targets were identified during the survey and listed for potential groundtruthing.

During field operations in June and August, we conducted in-water archaeological inspections of the *Lightburne*, *Essex* and *Idene*, and two of the most promising side scan sonar targets from the *Endeavor* cruise. At each of the shipwrecks scuba-equipped archaeologists completed visual inspections of the structural remains, documented the site using video and still photography; assessed the stability of the site, and estimated the extent of anthropogenic impacts – including looting.

In addition to these in-water investigations, archaeologists also conducted on-the-surface reconnaissance operations at the sites of the *Montana*, *Meteor*, *USS Leyden* and *Spartan*.

Besides the known wrecks, no side scan sonar targets from the 2008 *Endeavor* cruise represented either “certain” or “probable” archaeological sites (classifications “1” and “2” as described in 3.5 above). As a result, we selected three side scan sonar targets as representative examples and completed in-water archaeological investigations designed to identify the source of the acoustic target and determine the presence or absence of cultural material. In all cases, the sites were documented using video and still photography. If cultural material was found we were prepared to delineate the extent of that material and provide, as far as possible, an assessment of its date, form and cultural affiliation.

4 Results

4.1 Block Island and Submerged Cultural Landscapes

Historical research and the analysis of historical shipwreck patterns, combined with archaeological survey resulted in the identification of multiple cultural landscape contexts for the Ocean SAMP area. The contexts provide narrative framework that describe the significance of known and potential cultural heritage resources. The segments that follow do not represent the totality of the heritage resources in or near the project area. They represent known landscapes and associated resources that coastal planners, managers, and prospective developers will most likely encounter in the study area. As such they represent some of the most important findings of this study.

The location of Block Island at the crossroads of local, regional, national, and international maritime navigation and economic systems make drawing deliberate lines around specific landscapes and describing their significance challenging, but rewarding. The depth of coverage in these contexts varies from a very limited recognition of pre-contact Native American landscapes to a detailed discussion of the “energy landscape.” The limited treatment of the Native American landscape reflected an initial research design for the SAMP that separated this area out from the scope of work of this study. Future historical research and archaeological

investigations will add significant additional information to the landscapes discussed here and may result in the identification of additional cultural landscapes.

4.1.1 Pre and Post-Contact Native American Landscapes

Chapter Four of the Ocean SAMP report includes a general history produced the Narragansett Indian tribe. Including written sources and oral traditions, the history goes back centuries and includes the period before sea level rise submerged significant areas between the mainland and Block Island. The URI archaeological team was neither tasked nor funded to conduct research into Native American history or prehistory. Geophysical survey and analysis have identified conditions that might have resulted in the survival of material culture from submerged lands. Those are reported in a separate technical report.

Cultural landscapes occupy specific physical places as well as provide ways of identifying and organizing cultural and historical meaning. Indian people who used the lands before their submergence also hunted and gathered resources from the sea. Their descendants continue many of these traditional activities. While Indians have used these places in multiple ways and have the capacity to identify their own specific landscapes, that task is outside of the scope of this report and the expertise of the investigators. Indian practices and artifacts, however, are also elements in other cultural landscapes such as energy and fishing and are included in those contexts. A full implementation of CLA would integrate the Indian cultural landscapes, past and present.

4.1.2 European Exploration and Settlement 1492-1776

There are no *known* shipwrecks in the survey area associated with early European exploration. However, ample written and circumstantial evidence indicates that significant European maritime traffic passed by Block Island during the exploration and early settlement eras. The cultural and environmental legacy of that early activity is apparent today in the name Block Island and in the radically transformed island ecology (see energy context). The paragraphs that follow provide a context for understanding the expansion of maritime activity near the study area during the seventeenth and eighteenth centuries. Although outside of the known historical record, European vessels surely passed by Block Island in the sixteenth century as well (see 4.1.3 below).

The exploration and settlement of New England was a “vast maritime enterprise” in that conquerors and settlers traveled across the ocean and were sustained by it. Marine resources along with coastal and oceanic trade routes ensured the physical and economic survival of European colonies in New England, including Rhode Island (Bridenbaugh, 9-10). The Ocean SAMP area influenced and was influenced by these human processes. Some of these influences exist today as place names, archaeological sites (known and undiscovered), and altered marine and coastal ecosystems.

The recorded European exploration, contact, and settlement history of the Block Island area begins with the voyage of Giovanni da Verrazano in 1523. Under orders from the French crown, Verrazano explored the east coast of the present day United States from Cape Fear, North Carolina to Cape Cod, Massachusetts. Searching for the fabled “North West Passage” to Asia, Verrazano also spent considerable time interacting and trading with Indians. In April 1524, he sighted Block Island describing it as 10 leagues from the mainland, similar size to the island of Rhodes, hilly, forested, and triangular shaped. Noticing the many fires on shore, Verrazano

speculated that the island was heavily inhabited (Wroth 1970). Bad weather forced Verrazano to pass by Block Island. Sailing into Narragansett Bay and anchoring in Newport Harbor, he recorded his observations of the countryside, the plants and animals, and the local Indian people - their leaders, homes, and their interactions with the coastal environment (Wroth 1970).

Dutch East India Company sponsored explorations in the New York region led to several voyages through the SAMP area. On his fourth voyage in 1614, explorer Adriaen Block lost his ship the *Tyger* in a fire at Manhattan. In response, he built the 42-foot coastal vessel *Onrust* that he used to explore the East River, Long Island Sound, and parts of what is now the Ocean SAMP area, charting Block Island for the first time. Dutch interest in New York continued to influence the history and patterns of maritime commerce through the SAMP area well into the nineteenth century.

After European colonization, Rhode Island quickly developed aggressive and highly successful maritime enterprises. These rapid maritime successes reflect the unusual cultural and political history of Rhode Island's establishment, and its unique geography. For example, the circumstances of Roger Williams' move to Rhode Island established conditions that contributed to Rhode Island's rapid rise as a maritime economy and colony. Williams, considered the father of organized colonization in Rhode Island, was a religious radical with close ties to the Indian population. In 1636, he fled Massachusetts for Mount Hope Bay where the Indian chief Massasoit granted him land on east bank of the Seekonk River. Somewhat later Williams moved his expanding group to a site close to present day Fox Point where he reestablished the community he called Providence (McLoughlin, 6-7).

Other dissenters followed Williams to Rhode Island resulting in a collection of scattered settlements led by people with diverse and sometimes controversial religious beliefs. This diversity ultimately led to a social and religious openness that proved to be a critical asset to Rhode Island's maritime economy (McLoughlin, 3-4, 15; Bridenbaugh, 10).

Communication and commerce in Rhode Island depended on the water with most early households possessing one or more canoes (Vickers, 14). Roger Williams used these native craft to travel the colony and to visit and trade with local Indian leaders. The dispersed coastal settlement pattern combined with religious toleration to multiply the natural significance of Rhode Island's waterways, especially in Narragansett Bay.

The Rhode Island colony was a maritime place, bounded by protected waters, and gifted with good harbors and access to coastal natural resources. Fish provided food, fertilizer, and saleable commodity. The islands including Hog, Patience, Prudence, Dyer, Gould, Goat, Conanicut, Dutch and Aquidneck, contributed in important ways to Rhode Island's colonial settlement, survival, and economic success. With natural water access, many islands had good land, trees and fertile soil. The islands in Narragansett Bay and Rhode Island Sound proved critical for agriculture and animal husbandry offering confinement, forage, and safe havens from wolves for pigs and goats - and later cattle, sheep and horses. Indeed, the names of Hog and Goat Island reflect their early employment in Rhode Island animal husbandry (Bridenbaugh, 12-16). In 1639 grazing potential also drew attention to Block Island when William Codrington of Newport dispatched a small coastal trading vessel to Block Island with livestock. In 1661, Dr. John Alcock and a group of Roxbury men built a barque and transported cattle from Braintree to Block Island (Bridenbaugh, 43). The quest for fish and for places to raise animals brought

English settlement and increased vessel traffic to previously isolated areas within the Ocean SAMP boundaries.

Agricultural development proved critical to Rhode Island's survival as a colony and to its rapid maritime commercial expansion. As such, it directly influenced the Ocean SAMP area and surrounding landscapes. English settlers brought their own ideas about agriculture to Rhode Island, but also copied Native American practices including cultivating corn, a crop one could consume, trade, or feed to animals. Ultimately, animal husbandry proved easier and more lucrative than crop cultivation—and within a decade or two of settlement, Rhode Islanders, particularly those on Aquidneck Island, generated surpluses in pigs, goats, cattle, sheep and horses (Bridenbaugh, 39). Pigs had a special connection to Rhode Island's early maritime economy and to the diet of New England mariners. Foraging indiscriminately, pigs tore up the land and fattened quickly. Mature pigs were shipped by sea to Boston's butcheries where they became salt pork, a staple food of North Atlantic mariners and fishermen. By 1649, settlers introduced cattle into the commercial market.

Agricultural surpluses, protected harbors, economic freedom, religious toleration, and lax regulation from London ensured Rhode Island's early and aggressive economic development and reinforced its ties with the ocean (Bridenbaugh, 28-31). These developments brought English settlement and a new environmental regime to Block Island and increased vessel traffic through the SAMP area. Indian traditions and the observations of early explorers and settlers evidence the changes in the landscapes adjacent to the waters of the Ocean SAMP area.

The year 1776 brought war to Block Island waters. While the military landscape is addressed separately, the contemporary newspapers report the capture of numerous American merchant vessels by British Warships stationed off Block Island. These reports describe the trade routes of vessels and the commodities carried through or near the survey area. The *Leviathan* was seized carrying lumber from Milford Connecticut to St. Croix. The *William*, hailing from St. Eustatius for Salem, Massachusetts, carried a cargo of wine, rum, and linen. The whaleship *Mercury* was heading home to Nantucket from Brazil with a cargo of whale oil. The *Hawke* from Newburyport carried flower, beef, pork, and fish for Surinam (*Public Advertiser* 15 May 1777). Such cargos typified the New England maritime commerce during the colonial period.

Despite significant levels of traffic, there are few records of shipwrecks associated with Block Island during the colonial period. Three wrecks associated with Block Island occurred during the 1750s, the brig *Halifax* and ship *Palatine* in 1752, and the sloop *Martha and Hannah* in 1755. The *Palatine* wrecked on the Northeastern end of the island, well outside of the survey area. Many other wrecks certainly occurred, but have yet to come to light through historical research.

4.1.3 Fisheries Landscape

Located a few miles off mainland Rhode Island, Block Island is a natural fishing platform that has sustained commercial fisheries since the early days of English settlement. For thousands of years before the English commoditized local fish, Indians hunted and gathered marine resources on and around the island for subsistence use. In the second half of the nineteenth century, the island became the popular destination for sports fisherman that it remains today.

On Block Island and its surrounding waters, a cultural landscape exists that is defined by

fishing. Whether commercial, subsistence, or recreational, fishing involves the application and adaptation of human technologies in harvesting living marine resources. Because of the direct effects fishing has on the marine environment, any change in technologies, markets, and cultural meaning associated with it—however innocuous it might first appear—has the potential to cause significant changes in the condition of marine ecosystems.

Because fishing has been central to maritime cultures using Block Island and its waters for millennia, there is a high potential for encountering unknown but historically or culturally significant resources. On and around Block Island there exist many known or undiscovered and unrecognized components of a fisheries landscape, such as historic fishing vessels, fish traps, and working and remnant piers. The altered habitats of historic fishing groups also represent untapped opportunities to gain important knowledge about human activities and their relationships with the marine environment. Despite the significance of commercial fisheries in history and culture, marine archaeologists have until recently paid little attention to its study. Many historic resources associated with commercial fishing in New England and Mid-Atlantic resources have been lost because their significance was not recognized.

Part of a continually unfolding story, fisheries resources include unique or representative fishing vessels and the archeological remains of traps and piers. Those fifty years old or older are likely candidates for the National Register of Historic Places. Fixed on shore, the presence of historic submerged piers or fish traps are easier to determine and locate than wrecks. The locations of many fishing vessels wrecks are unknown—indeed, the number of vessels lost in the area since the European contact is unknown. Fishing brings with it important historical and archaeological research questions and has implications for the siting of new structures in the waters off the Block Island.

4.1.3.1 Fishing, Subsistence and Sustainability on Block Island

Significant living marine resource use and human habitation have been connected for thousands of years on Block Island. Modern archaeological investigations suggest that Indian people living on Block Island depended heavily marine plant and fish life as early as 3000 years ago (Tsekov 1997). There is historical evidence of significant Indian fishing during the late 17th century on Block Island. Two centuries later, beach walkers continued to find heavy grooved stone sinkers fashion by Indian fishers on Block Island (Livermore 1877).

Fish and marine vegetation directly and indirectly influenced diets and ecological conditions on Block Island, promoting sufficient nutrition and sustainable agriculture. Beginning in the late 18th century, possibly earlier, Block Island farmers (many of them also fishermen) used seaweed to protect crops from extreme weather and to nourish the heavily worked soil. Farmers also mixed seaweed with fish offal and soil to create compost. These marine resources and local agricultural practices maintained the soil's fertility despite centuries of intensive use. Livermore, the island's principal early historian, noted that Islanders gathered over 6,000 cords of seaweed valued at \$10,000 in 1875. At that time, many Islanders maintained exclusive rights to collect weed from specific areas of the shore (Livermore 1877: 30 -32). A large area of public beach also remained opened to all islanders to gather seaweed. Such boundary divisions are important markers of a fisheries cultural landscape on the island.

Commercial fishing has long and important history in New England. Intimately tied to early exploration and settlement in the region during the first century of European contact, fish enticed

thousands of ships and tens thousands of European mariners and fisherman to cross the North Atlantic to the Americas. They discovered and charted off shore banks and interacted with native people. In terms of economic value, the fish caught and processed by the French and English fishermen outstripped the more famous New World treasures of gold and silver extracted by the Spanish Empire (Fagin, 2006; Pope, 2004).

Cod was the most important species for the Atlantic markets. Great abundance combined with a low level of oil in the flesh made it possible to store dried salted cod for extended periods. Cod, caught in the fall and the spring of the year, was the most important commercial species for Block Island fishermen in the 19th century. In 1880, Block Island fisheries employed 263 people, producing in excess of one million pounds of fish, roughly three-quarters of this was dry cod. The waters also produced bountiful others species such as dogfish, mackerel. Fishermen from other Rhode Island ports as well as from other states also fished in the SAMP area in the 19th century (Goode 1884).

Block Island fishermen developed distinctive type of fishing craft. Double ended and highly seaworthy, Block Island fishing boats coped with the heavy seas that commonly lashed the island and could ride out the intermittent violent Atlantic squalls that claimed other small craft. Local lore proudly reports that none of the islands double-ended fishing boats ever sank. While strictly true or not, the Block Island boats engendered respect along the coast and demonstrate the close connection between island fishermen and the local marine environment.

Attached to entrenched methods and technologies, Block Islanders proved conservative in the face of the rapid changes occurring during the later nineteenth century, for example resisting the introduction of new fishing technologies to “their” waters in the 1880s (Goode 1884). One important exception came in the late 1860s when fish traps or pound nets came into use around the island. Pound nets required that may pilings be driven in regularly spaced intervals near shore areas around the island, the remnants of which might still exist today (Livermore 1877; Goode 1884, p. 301). The rough Atlantic environment made maintaining traps challenging, but archaeological remnants may well remain.

4.1.3.2 Historic Harbor Features

Commercial fishing drove the development of harbor facilities in the SAMP area in the 17th through the 20th centuries. In 1670’s, the first legislation supporting the construction of a pier at Block Island cited the encouragement of fishing as its principle justification. For the next two centuries and beyond, all efforts to build harbor facilities at Block Island had strong ties to the fisheries (Livermore 1877; Goode 1884). In 1816, Block Island fisherman constructed the “pole harbor” near present day old harbor. Consisting of pilings driven into the bottom and boulders, the pole harbor offered adequate shelter in normal conditions. If stormy weather threatened, fishermen pulled their boats on to the shore. By 1870s and the opening of the government pier, the pole harbor consisted of 750 pilings (Goode 1884; Mendum 1897).

4.1.3.3 Historic Fishing Vessel Shipwrecks

The wrecking of ships, particularly of fishing vessels has occurred throughout the centuries in Rhode Island and remains a common occurrence in the SAMP area during the present day. How many wrecking in the survey area remains unknown as fishing is an elusive and often confusing subject in the historical record. Accounts of the transporting and selling of fish are available for

some places and periods. In the later 19th century, government-generated statistics become more common. However, in the distant past and in more recent times, the records of individual fishing voyages remain rare and those that survive usually reveal little information about actual fishing activities, much less fishing life. Official documents from between the 16th to the early 19th centuries rarely recorded (or at best under recorded) the losses of fishing vessels. Based on examinations of archival sources, historic newspapers, and federal records the pattern of underreporting seems to continue in the late 19th and into 20th centuries.

The potential for unreported but historically significant commercial fishing vessel wrecks of historical significance in the SAMP area and surrounding waters is extremely high. The potential within the survey area is more difficult to assess. The most important individual wrecks would be the rare early vessels of 16th through the mid 19th centuries where historical documentation is sparse or non-existent. However, when considered as part of a larger fisheries landscape in Rhode Island and in the SAMP area, fishing vessels and associated technologies from the late 19th century through the 20th century have the potential to provide an unbroken, representative, and highly informative archaeological record. These types of cultural heritage have extraordinary potential to add significant new knowledge to our understanding of marine environments and cultures. Although too often overlooked because the unromantic uses and perceived commonality, it is essential to note that any commercial fishing vessel built 50 years ago or more may be eligible for the National Register of Historic Places. Research is clearly needed to identify these resources and to develop standards to evaluate these wrecks for purposes of study, public use, and historic preservation.

Cultural heritage research relating to commercial fishing is in its early stages in neighboring Massachusetts, where archaeologists and biologists at Stellwagen Bank National Marine Sanctuary have located several sunken fishing vessels. Efforts are underway to evaluate and nominate some of these wrecks to the National Register of Historic Places. Many wrecks of similar vessels exist in the waters surround Block Island and in adjacent waters. While not all of the wrecks likely merit preservation, they require inventory and assessment—a level of study that will generate an improved understanding of the Block Island area’s cultural and natural heritage.

4.1.4 Military Landscape

Since the beginning of the seventeenth century, twenty or more wars and endless minor conflicts have affected the composition of maritime cultural heritage on southern end of Block Island and the Ocean SAMP area. Some of these wars such as the Revolutionary War, the Quasi War with France, the War of 1812, and World War II had clear effects on maritime transportation near Block Island. During these wars, control for of sea-lanes was contested by warring nations, and in some cases, particularly the case of World War II, resulted in historically significant shipwrecks off of Block Island.

Among the wars, the American Revolution and the two World Wars (especially World War II) proved especially influential on the region’s marine cultural landscape. The Revolutionary War altered the trajectory of Rhode Island history, reshaped its economy and played host to fighting on land and at sea that resulted in at least 33 historically significant shipwrecks in Rhode Island waters. Likewise, the global conflicts of the first half of the 20th century, especially World War II strongly influenced Rhode Island history and the Ocean SAMP area’s cultural landscape. Naval facilities, bases, warships, fuel depots, hospitals, gun emplacements, testing ground, and

shipwrecks from WWII all contributed to the fabric of the SAMP area history and many elements remain as archaeological or historic sites.

The outbreak of the Pequot war is tied to the study area. In 1634, John Oldham, a trader from Massachusetts, was killed during his interactions with Indians on Block Island. In response, Massachusetts attacked, conquered and settled the island.

The three Anglo - Dutch Wars (1652-1654, 1665-1667, 1672-1674) affected in long-term ways patterns trade and traffic through the SAMP area. New York's extraordinary influence on the history of Rhode Island traces directly to the early Dutch colony of New Amsterdam and the conflicts it engendered. The regional Dutch - Rhode Island connections persisted after the English took control of New York in 1664, continuing to influence trading relationships and traffic patterns through the SAMP area for centuries.

During the period covering King William's War (1689-1698) and Queen Anne's War (1702-1713), the English government failed to control or regulate Rhode Island. The religiously tolerant, independent-spirited, and economically motivated Rhode Islanders refused to supply soldiers or military support to New England colonial armies (McLoughlin 52-53).

In contrast to their lack luster contributions to warfare on land, Rhode Islanders enthusiastically embraced the for-profit warfare of privateering. During the many Anglo-French wars (1689-1754) Rhode Island and other colonies licensed large numbers of privateers that sailed through the waters of the SAMP area. Privateers were privately owned, armed ships licensed by the government in times of conflict and granted permission to raid enemy shipping. Privateering could be highly profitable and provided some level of naval defense for the colony. In 1690, Thomas Paine, a privateer from Jamestown, helped drive off French ships that landed on Block Island (McLoughlin 52-54, 80).

During the late-17th and early-18th centuries the distinctions between legal privateering and illegal piracy became blurred. Thomas Paine, the hero at Block Island, was suspected of piracy, and the colony produced the well-known pirates such as Thomas Tew and Captain Want. In the 1690s, Rhode Island reportedly welcomed the famed pirate William "Captain" Kidd (Hawkes). Pirate booty boosted the Rhode Island economy, fattening the purses of certain merchants and government officials who might overlook illicit cargos and questionable practices (Bridenbaugh, 25). After about 1720, piracy along the eastern seaboard of colonial America declined and the separation between illegal pirates and legal privateers became clearer.

During King George's War and the French and Indian War (1739 – 1749, 1754 – 1763), Rhode Island dispatched a large numbers of privateers. During King George's War (1739 – 1749) Rhode Island was home to 25 percent of all privateers in operating in America (Swanson, 185). During the French and Indian War (1754 – 1763), powerful Rhode Island merchant families such as the Browns and Bannisters dispatched fleets of privateers through the SAMP area waters.

The French and Indian War emptied the British government's coffers, leaving an immense war debt that threatened the national economy. The clumsy plans devised by Imperial authorities to raise revenues from the American colonies threatening the cherished semi-independence and finances of Rhode Island and sister colonies and ultimately led to the War for Independence.

A Maritime-based economy meant that the new heavy British hand was perhaps felt sooner and with more pain in Rhode Island than in the other British North American colonies. Rhode Island responded by becoming the first colony to take up arms against Britain, the first to propose a Continental Congress, the first to formally sever ties with the British monarchy, and the first to create a navy.

Armed resistance to British rule in America began on Rhode Island waters and set the stage for the development of the United States navy. In December 1763, the HMS *Squirrel* sailed through the waters included in the SAMP area and into Narragansett Bay to enforce the new regulations. Seven months later in July 1764, at the orders of two members of governor's council, gunners fired eight shots at a tender from *Squirrel* after a British-sparked mobbing incident at Newport.

Attacking Royal Navy vessels became a pattern in Rhode Island. Major incidents occurred in 1765 when a Royal Navy ship *HMS Maidstone* attempted to impress local sailors at Newport, and in 1769 when a mob boarded the Royal Navy ship *Liberty*, running it ashore and setting it aflame (McLoughlin 86, Bartlett 6: 428-429; Carroll 239-255).

The most important incident of this kind was the burning of the HMS *Gaspee* in the Providence River by disgruntled colonists in 1772. The *Gaspee* affair ranks alongside the Boston Tea Party and the Stamp Act Crisis as a large step on the road to the American Revolution (Bartlett; McLoughlin, 90-91).

The colony's independent streak and eye for profits continued in the early 1770. When the other colonies banded together in refusing to accept imported British manufactures, Rhode Island claimed poverty and abstained. As a result, Rhode Island Sound and Narragansett Bay remained open to British commerce. At a direct cost to the other colonies, ships, goods, and money flowed through the SAMP area waters into Rhode Island's ports (McLoughlin, 90).

The 1773 Tea Act and the infamous Boston Tea Party fed Rhode Islanders appetite for rebellion. In 1774, Rhode Island called for a Continental Congress and became the first colony to elect delegates. During this period, British warships increased operations in Rhode Island Sound beginning to block traffic into and out of Narragansett Bay.

In June of 1775, the Rhode Island legislature established America's first navy, commissioning the *Washington* and the 12-gun sloop *Katy* (later renamed the sloop *Providence*). Within a few days, the *Katy* captured the Royal Navy's tender *Diana* (tender to the HMS *Rose*) off Jamestown, in some respects the first naval battle of the Revolution (Fowler).

In October 1775, the Continental Congress passed a Rhode Island-proposed resolution to create a Continental Navy. Rhode Island supplied two of thirteen new ships, the 28-gun frigate *Providence* (a different vessel from the sloop *Katy/Providence*), and the 32-gun frigate *Warren*. The following month, Rhode Island sea captain Esek Hopkins became the Continental Navy's first commander-in-chief (Fowler).

Some of the United States Navy's earliest actions took place in SAMP area waters. In April 1776, Commander-in-Chief Esek Hopkins, captaining the *Providence*, captured the British tender *Hawk* off Block Island and the bomb vessel brig *Bolton*. On April 6, Hopkins' squadron engaged but did not capture HMS *Glasgow* off Point Judith. The following month, John Paul

Jones, often considered the father of the American Navy, became the captain of the sloop *Providence* (the former *Katy*) (McLoughlin 96).

In a dramatic prelude to the formal United States Declaration of Independence, on May 4, 1776, Rhode Island “abrogated its allegiance to the king.” The waters around the Rhode Island, including the study area became state waters on July 22, 1776 when Rhode Island altered the identity on its charter from “colony” to “state” (McLoughlin 92-93, 94).

As with earlier imperial conflicts, Rhode Island embraced privateering during the Revolutionary War, commissioning 65 privateers between May and December 1776.

In December 1776, the British took Newport in an amphibious assault. The subsequent three-year British occupation had dire consequences for maritime Rhode Island, ending forever the glory days of Newport-owned ships transiting the SAMP area waters on their way to distant markets. Many colonial merchants fled, taking their trade and shipping with them. Rhode Island’s center of political and economic influence shifted from Newport to Providence, where it would remain after the war ended.

Britain also responded by cutting off Rhode Island’s customary access to the sea, and station vessels off Block Island to cut off access to Narragansett Bay. Dozens of ships were seized (see exploration and early settlement landscape) brought serious hardships for patriots in Providence.

The British occupation of Newport and control of the entrance to Narragansett Bay had trapped the new frigates *Providence* and *Warren* along with the sloop *Providence* at the head of the bay. In February 1778, the *Warren* slipped the blockade, followed a month later by the *Providence*. The Continental ship *Columbus* failed in its bid for the open sea, running aground and burning near Point Judith.

In March 1778, France recognized the United States of America and entered the war as an ally. This changed the war’s character from a colonial rebellion to a broader European and Atlantic conflict. The French king sent a fleet under French Admiral d’Estaing, to assist the Continental forces. One of d’Estaing’s first actions involved supporting an unsuccessful American effort to liberate Newport in the summer of 1778.

The French fleet comprised 12 ship-of-the-line, 4 frigates and 2,800 marines, a force far more powerful than the British frigates and smaller vessels stationed in Rhode Island. Between July 29 and August 8, 1778, faced with certain capture, the British forces sunk, scuttled or burned all of their vessels. English losses including the sloops *Kingsfisher* and *Falcon*, the galleys *Alarm* and *Spitfire*, and the frigates *Lark*, *Cerberus*, *Orpheus*, *Juno* and *Flora* as well as 13 transport ships in Newport Harbor (Abbass). Today, all of these wrecks are almost undoubtedly eligible for the National Register of Historic Places.

Despite these successes, the American and French efforts to take Newport stalled. The British, however, finally withdrew from the Island and Newport on their own accord in October 1779.

In July 1780, a French fleet under Admiral Ternay carrying carry troops commanded by the comte de Rochambeau arrived in Newport. French warships stayed through the following winter. In March 1781, General Washington and Rochambeau, who would become the

architects of the British defeat at Yorktown, held a series of strategic meetings at Newport. Shortly thereafter, the French evacuated Rhode Island (McLoughlin 99).

Between 1798 and 1800, the United States fought the so-called Quasi-War with France. Rhode Islanders participated enthusiastically, sending out many privateers to stalk French merchant ships. Significant skirmishes occurring off Block Island

The War of 1812 brought a mixed reaction in Rhode Island. The state government opposed the war, however, the lucrative prospects of privateering enticed many Rhode Islanders into action. One Bristol privateer, the *Yankee* captured 40 vessels worth a total of \$5,000,000 (Coleman 1963). No battles took place in Rhode Island; however, the heavy presence the British Navy's off the east coast including Long Island Sound and the Block Island area seriously hampered Rhode Island's maritime activities.

The Civil War (1861-1865) renewed a relationship between Rhode Island and the U.S. Navy that would continue for the next 150 years. At the beginning of the war, the Union government, concerned about the proximity of the Naval Academy at Annapolis, relocated it to Newport. Despite strong efforts to keep the Academy in Rhode Island, it returned to Annapolis after the war.

In 1869, underwater mines and explosive warfare were in their infancy and the Navy established a torpedo experimentation and development facility on Goat Island. The Newport torpedo development, testing, training and manufacturing station is central to the history of the propeller-driven torpedo in America. The navy subsequently established testing ranges inside Narragansett Bay and in Rhode Island Sound.

The Navy expanded operations to include Rose (1883) and Gould (World War I) Islands. During World War I, the Newport Torpedo Station added depth charges and mines to its manufactures. During World War II, the station had 13,000 employees who manufactured 57,653 torpedoes, or about a third of all torpedoes manufactured in the United States. In 1942, the Navy authorized the station to proof-fire 100 torpedoes a day. Today, unexploded torpedoes and other ordinance are historically significant, if potentially dangerous, components of the military landscape of Narragansett Bay and Rhode Island and Block Island Sounds. In 1944, the Stonington, Connecticut fishing trawler *Nathanial B. Palmer* sank after a mine caught in a fish net exploded.

Naval facilities developed to service this growing Navy presence. In 1900, the Navy created the Bradford Coaling Station at Melville, near the site of the Portsmouth Grove Civil War hospital. By 1917, the coaling station had developed into a general fueling facility, with extensive oil storage capacity. By 1937, it could store 13 million gallons of fuel. More capacity was added during World War II. On the eve of the Second World War, six battleships, eight cruisers, thirty destroyers, two submarines, two destroyer tenders and two supply ships along with many smaller vessels were based in Rhode Island.

In 1940, the Navy broke ground on what would become the Quonset Naval Air Station, one of two naval air stations on the east coast. Used first as a training facility, it became a command center for the First Naval District. "Quonset-based aircraft carriers and planes participated actively in antisubmarine warfare, convoy escort duties, and air and sea rescue missions, as well as in air patrol operations in coastal waters" (Schroder 1986, p. 86-88). In 1942, the Navy built

the Naval Auxiliary Air Facility in Charlestown with an on-the-ground deck for carrier landing practice. The skies above the study area saw countless thousands of over-flights by military aircraft, several crashed in coastal waters.

Other naval facilities developed in Rhode Island during World War II included: a naval supply depot at Coddington Cove (1942); the naval net depot that built steel anti-submarine nets (1941); a marine Barracks at Coddington Cove (1943); a naval magazine on Prudence Island (April 1942); a communication station at Beavertail (1941); a small arms firing range at Sachuest Point (1942); a naval operating base in Newport (August 1941); an anti-aircraft training center at Price's Neck near Brenton Point (1942); an inshore patrol facility on Long Wharf in Newport; and a demagnetizing facility at Gould Island used to counteract mines or torpedoes attracted to ships or detonated by magnetism (Schroder 1986).

In 1942, the Navy built a Motor Torpedo Boat (Patrol Torpedo Boat) Squadrons Training Center at Melville (February 1942). By 1944, the center's 28 PT boats worked extensively in the Rhode Island coastal waters and acted as listening posts farther out to sea (Schroder).

Between 1952 and 1973, the Cruiser-Destroyer Force Atlantic was based out of Newport. In 1973, the Navy dramatically downsized its Rhode Island presence, causing serious economic damage. The War College remained open, as did the Navy Undersea Warfare Center and a smaller navy unit, known as Surface Group 4, comprising mostly frigates and minesweepers (Rhode Island Historical Society 1993).

The history described above has influenced the Ocean SAMP study area in many ways over the past 300 years. Conflict and peacetime Navy operations have left a rich repository of submerged archaeological sites, few of which have been surveyed. By far the greatest numbers of potential and known sites are tied to World War II and/or the development of Naval facilities in Rhode Island during the later-19th and 20th centuries. The resources associated with these later naval activities include vessels lost by accident, vessels deliberately sunk as part of weapons testing, derelicts, military aircraft, merchant marine vessels sunk during war, ordnance, and other lost or abandoned military equipment. The locations of some these resources are known, however many others certainly await discovery.

Shipwrecks and other submerged archaeological sites tied to the American Revolutionary War are central to understanding the importance of the military landscape of the Ocean SAMP area. Rhode Island's coastal waters have perhaps the largest number of known Revolutionary War shipwreck sites in the United States. The intensity of American, British and French military activity in Rhode Island from 1775-1778, makes it probable that unidentified vessel losses occurred and that yet unknown Revolutionary War shipwrecks await discovery in or near the Ocean SAMP area.

Rhode Island was one of the great centers of American privateering during many of the wars between the late 17th century and the end of the War of 1812 and numbers of related shipwrecks almost certainly occurred in the SAMP area. Two privateers are known to have been lost in Rhode Island waters and more likely await discovery.

Known and potential military-related shipwrecks from other periods of Rhode Island history also contribute to the submerged military landscape. While few in numbers and less characteristic of the overall landscape, some of these may be highly significant. Military vessels

from the late-17th century or early-18th century, if discovered, they would contribute significantly to our understanding of Rhode Island history.

4.1.5 Energy Landscape

For nearly 300 years, the production and transfer of energy has shaped the cultural landscape of the SAMP area and adjacent coastal areas. The initial shaping took place on land, but during the nineteenth century, it encompassed the ocean.

For more than one thousand years before the European invasion of New England, Block Island supported large Indian populations. They met their energy needs by taking sustainable quantities of wood from the island's dense forests. When Europeans settled Block Island in 1662, they commenced altering an ecosystem and visual landscape created through centuries of deliberate Indian activity (Cronon 1982). The limited coverage of trees and miles of stone fences marking the island today resulted from a quest for energy that soon exhausted the Island's forests. In 1721, Simon Ray, a town elder warned that the wasteful consumption of trees could force the community to abandon the Island for lack of fuel and building material. Survival came not from rational conservation but the discovery of Block Island's vast beds of peat. Composed of wet compressed decomposed organics; peat is the geological ancestor of coal. Using peat for fuel required Block Islanders to engage in the time consuming and laborious process of digging, flattening, stacking, and drying. Known as "tug" on Block Island, the fuel was carefully stored in purpose build "tug houses." Between about 1750 (possibly earlier) and 1860, peat provided the only reliable source of energy on Block Island (Livermore 1877). The work required to gather and process peat, made it an expensive source of energy when measured in terms of human time and effort. In effect, Block Islanders have been paying a premium for energy for nearly three hundred years though hard work and high prices.

A shipwreck in Cow Cove in 1846 brought some interest in a new fuel for Block Island, coal. However, it took some time for coal to be accepted on the Island with the shift from native peat to imported coal coming with the 1873 completion of federal protected harbor and landing (Old Harbor). Begun in 1870, the harbor ushered in a new era on the Island. According Reverend Samuel Livermore, a Block Island historian writing in 1877, more construction had taken place on the island in the previous five years, than in the fifty that preceded it. Livermore also described in the installation of the Island's first coal furnace, in the First Baptist Church in 1875. By that year, Islanders had gotten past their fears and had shifted to coal for their household stove.

In 2010, the transportation of energy dominated commercial shipping through the SAMP area, accounting for 80 percent of the volume of cargo entering Narragansett Bay. This figure will rise if the proposed Hess LNG terminal at Weaver's Cove is constructed. Transporting energy by sea brings risks. In 1996, the *North Cape*, a barge containing 3.9 million gallons of home heating oil, grounded at Moonstone Beach in Rhode Island. The ensuing spill of 828,000 gallons was the one of the worst environmental disasters to occur in Rhode Island's waters. In terms of human use and its cultural and environmental impacts, the *North Cape* grounding was but one of hundreds of energy transport related accidents that have occurred over the past 170 years in the SAMP area (<http://www.fws.gov/Contaminants/restorationplans/NorthCape/NorthCape.cfm>, Ocean SAMP Chapter 7).

New England's dependence on energy delivered by sea through the SAMP area resulted from major historical processes that transformed the United States into the world's leading industrial economy. Three processes directly associated with Rhode Island created unprecedented demands for fuel in New England: the introduction of stationary industrial steam engines, the expansion of heat intensive metal manufacturing processes, and the replacement of wood by coal for industrial energy. Just as industrialization shaped Rhode Island's historic landscapes on land, it exercised parallel effects in the SAMP area, leading or contributing substantially to hundreds of accidents and deaths through shipwrecks and to major alterations to environment through the construction or improvement of harbors, dredging of shipping channels, construction or improvements to lighthouses, docks, and lifesaving stations.

Although the "Ocean State", Rhode Island's history is more commonly associated with industry than the ocean. Many landmark moments in U.S. industrial history occurred in Rhode Island. In 1780, the Brown family installed the second industrial steam engine in the United States. Used to pump water, the engine kept an iron mine in service that supplied a successful Brown blast furnace (Hunter 1985). Ten years later in a historic partnership, Moses Brown and the English millwright Samuel Slater constructed the first Arkwright-style textile mill in the United States (Coleman 1963). Like other American mills of the period, the motive power came from flowing water. However, in another Rhode Island first occurring in 1827, Slater established a steam-powered textile mill at Providence. Slater's steam mill also effectively inaugurated the New England energy lifeline. The anthracite coal used to fuel the mill originated in Pennsylvania's Schuylkill region (Coleman 1963). Coal's several hundred-mile journey from mine to mill followed a freshwater path to Philadelphia where it embarked on a sea voyage that passed by Block Island into Narragansett Bay and up to Providence.

The adoption of the stationary steam engine, such as the one used by Slater, facilitated the growth of industry in New England, and freed it from geographic dependence on waterpower. Stationary steam allowed industry to centralize in urban areas where mill, factory, and foundry operators could find readily available pools of skilled and unskilled labor, excellent sources of capital, and well developed ports and railway connections (Hunter 1985). Providence became the national capital for stationary steam with the 1849 patenting of the Corliss Engine, developed and manufactured in Providence. With improved fuel efficiency and operational consistency, the Corliss became the nation's most important steam engine with nearly 500 constructed in Providence before the Civil War (Hunter 1985).

The Corliss works was one of many energy intensive precious and base metal enterprises that transformed Rhode Island into America's most industrialized state. By 1880, Rhode Island's steam engines produced 38.1 horsepower per acre; nearly double Massachusetts (21.3), four times New Jersey (9.8), and nine times New York (4.9) (Hunter 1979). Rhode Island's concentrated style of industrialization was occurring across the urban areas of southern New England. Between 1850 when Americans consumed an estimated .36 lbs of coal per capita and 1918, coal consumption grew 77-fold nationwide, with a sizable proportion of this increase occurring in New England. By 1907, Americans were consuming nearly 5 tons of coal per capita annually (Schurr 1960). In the industrialized areas of New England, the per capita consumptions was much higher. That year, over 10 million tons of coal arrived at New England ports; 3.5 million in Providence alone. In 1918, perhaps the peak year for the coal trade, the regional figure of coal shipped by sea reached nearly twenty million tons (Gordon 1978; Atlantic Deeper Waterways Commission, 1908).

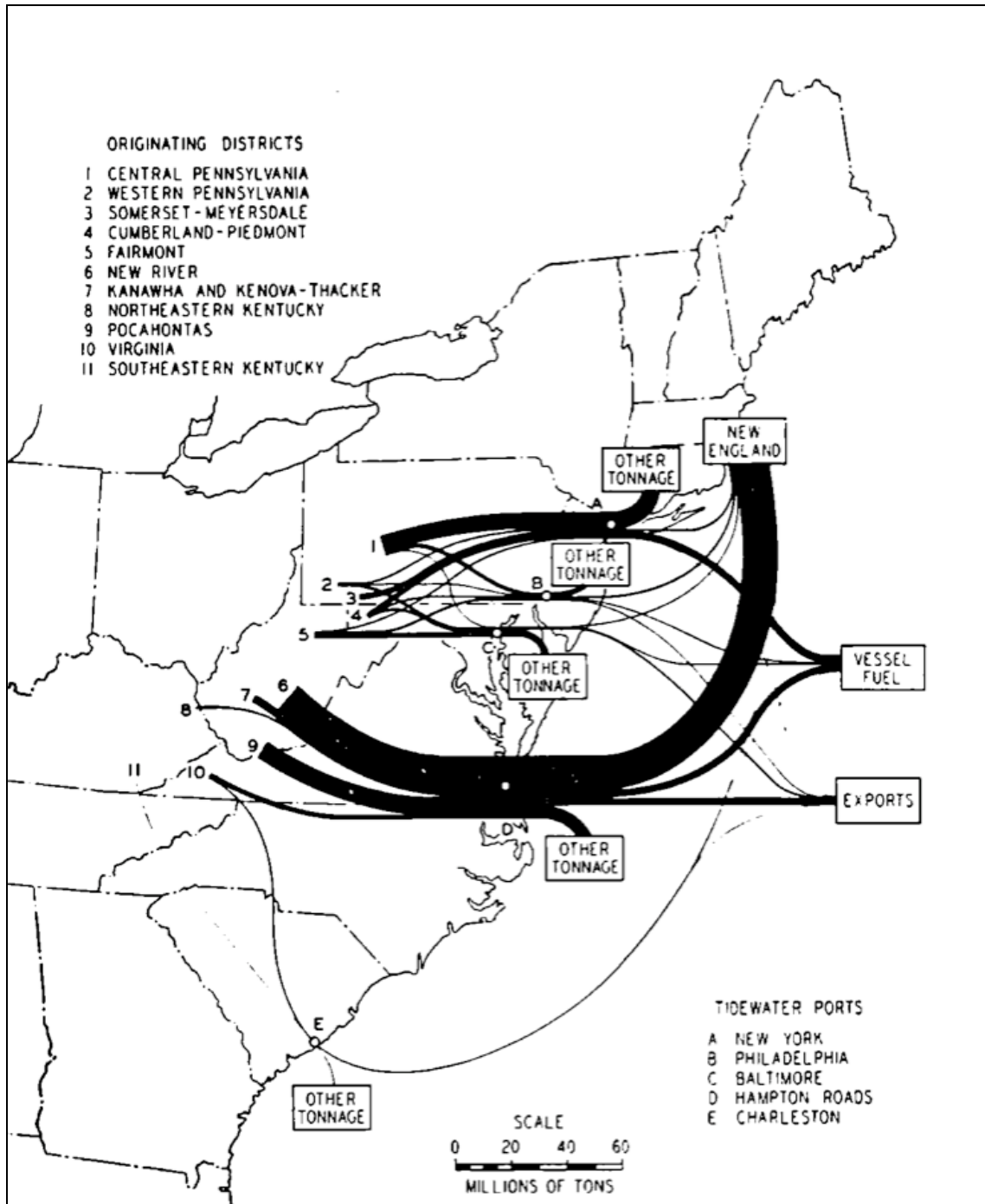
Unlike America's other industrializing regions, New England lacked native coal in industrial quantities. For New England's industries to thrive, they relied on inexpensive coal mined in Virginia, West Virginia, Kentucky, Ohio, and Pennsylvania and transported as cheaply as possible. During the second half of the nineteenth century an add-hoc and grossly inefficient system of coal transportation by sea developed. Canals, rivers and railroads carried coal to the major Atlantic ports where it was loaded on a grimy armada of schooners, schooner-barges, and barges that sailed or steamed north to a bewildering array of destinations. Figure 3 below produced in 1929 depicts the general flow of coal from mine to New England. (It does not represent the several ports that shipped coal through much of the period when coal transportation to New England expanded. By the 1920s, coal shipping had centralized in Virginia). In 1903, midway through the expansion of the coal trade, the principal coal companies reported delivering product to 142 separate destinations, most of them in New England. The quantities sent were huge, but many of the vessels were not. In January of that year, Boston received 333,000 tons of coal and Providence 181,000 tons (57th Cong. 2nd Sess. H. Doc. 15 pts 7,8 & 9 *Monthly Summary of Commerce and Finance of the United States for the Fiscal Year 1903*).

Large quantities of coal combined with a decentralized fleet, many of them small vessels made the New England coal trade contribute to the highest levels of traffic and human activity in the recorded history of the SAMP area. During the peak decades of coal, maritime traffic dwarfed the contemporary levels described in the Ocean SAMP Chapter 7, exceeding it by orders of magnitude in terms of the numbers of ships and transits. In 1893, more than 60,000 vessels passed by Point Judith. Most of these (34,000) were classified as schooners. Barges accounted for an addition 9000 transits. With current data, it is difficult to precisely estimate the proportion of these vessels engaged in the coal trade but it would include nearly all of the barges, and probably a significant majority of the schooners. The 60,000 figure does not include the sizable number of larger schooners and schooner-barges that passed through the SAMP area east of Block Island the same year (55th cong. 2d session House Document 60, *Harbors of Refuge at Point Judith, Block Island, and Great Salt Pond, etc.* 1903).

At the beginning of the twentieth century, coal carriers followed one of two main routes through the SAMP area. Many, probably the majority, steered a course past Point Judith, sailing closer to the mainland than Block Island. Larger vessels or those transiting to or from ports further north often passed east and south of Block Island. When threatened by heavy weather, these vessels sought protection on the lee sides of Block Island, a practice that contributed to many shipwrecks (55th cong. 2d session House Document 60, *Harbors of Refuge at Point Judith, Block Island, and Great Salt Pond, etc.* 1903).

Future research is required to provide estimates of the number of wrecks occurring in the SAMP area before the Civil War, or that relate to commercial fishing. Current data, however, suggests that the majority of shipwrecks in the SAMP area involved transportation of coal to New England during a fifty year of period between 1870 and 1920 when the United States developed into the world's largest industrial economy. The rapidly increasing demand for abundant AND inexpensive energy in New England led to the creation of an ad hoc system of transportation that relied on many low-cost and vulnerable types of vessels operated by poorly paid mariners who represented the lowest strata on the maritime social scale (*Hearing Held Before the Committee on Merchant Marine and Fisheries on House Bill 11372*, December 14, 1911).

Figure 3. Tidewater Shipments of Bituminous Coal, 1929



The study area's energy landscape is highly significant in the history of Rhode Island and greater New England. The coal vessels provided critical infrastructure, without which the region would have languished economically after the Civil War. It has been a largely forgotten chapter in the states maritime or industrial history. Where merchant vessels such as the famous Brown family East Indiaman *Ann and Hope* that wrecked at Block Island in 1815 were highly visible in cultural terms and associated with the wealth and social status of their owners, the coal vessels

brought few and fleeting profits and only rarely contributed to social status to their owners, officers, or crew. Indeed other merchant mariners often regarded the grimy armada of coaling vessels and their crews with mixture contempt and pity due to the low wages, harsh living conditions, mixed racial composition of the workforce, and the frequent accidents they endured (*Hearing Held Before the Committee on Merchant Marine and Fisheries on House Bill 11372*, December 14, 1911).

The rapidly growing New England coal trade operated within a unique context of obsolescence, innovation, and forced operational economy. It resulted in a complex and historically significant cultural landscape in the SAMP area consisting of shipwrecks, harbors, canals, lifesaving stations, and aids to navigation. Among the most common wrecks are those of merchant sailing vessels built in the 1850s, 1860s, and 1870s and repurposed to carry coal. They were often towed in long lines behind steam tugs. As the demand for coal continued to grow and the supplies of older ships diminished, new classes of vessel evolved to fill the void, including some of the largest commercial sailing vessels ever built (Snow and Lee: 1999). Less majestic and more common, shipyards turned out specially designed schooner-barges—sail-equipped vessels with some capacity for independent navigation. Over time, however, the relentless drive for economy led to an increasing emphasis on cheap, easy to construct barges – many with poor seagoing capacities.

A full analysis of wrecking in or near Rhode Island's outer waters has not been completed, but preliminary research conducted by SAMP researchers suggest that number of serious wrecking events occurring per decade in the region may have increased as much as six-fold between 1870 and 1900, with disasters continuing to occur at high levels into the 1920s. The most serious accident, the sinking of the Joy Line Steamer *Larchmont* through collision with a coal schooner occurred in 1907. That one event alone resulted in the deaths of more than 100 people. In 1909, a collision between the *Merrill C. Hart* and *John S. Bennett* sunk both vessel and claimed 11 lives. The *Bennett* was heading to Halifax N.S. with a load of coal while the *Hart* was heading to New York probably to load coal (*New York Times* 11/10/1909; *Annual Report Chief of Engineers* 1910: 12). In 1911, destruction of the coal carrying schooner-barges *Vermont* and *Helen A. Wyman* near Block Island claimed six to eight lives, possibly including the wives of the two captains. The wreckage thoroughly covered the island's western beaches (*New York Times* 11/21/1911).

The shipwrecks of the SAMP area's energy landscape are important heritage resources associated with the industrialization of American seafaring. While not every wreck merits preservation, they all potentially contribute a broader understanding of human activity within the SAMP area. At the very least, many of the energy related shipwrecks are almost surely eligible for the National Register of Historic Places. In addition, specific areas of the SAMP may be eligible as rural cultural landscapes. Other locations are beginning to study and preserve industrial vessels such as those found in the SAMP area. At the Stellwagen Bank National Marine Sanctuary in Massachusetts, NOAA archaeologists recently documented three coal schooners, *Paul Palmer*, *Frank A. Palmer*, and *Louise B. Crary* and prepared a successful nominations to the National Register of Historic Places. Archaeologists working in the Great Lakes region have documented and nominated numerous industrial era steamers, schooners, schooner-barges and related craft. Determining which of wrecks in the SAMP area's energy landscape should be included on the Register will require a broader scale regional study. At this point, any coal vessels built more than fifty years ago are potentially eligible for listing.

There is no clearly defined temporal end to the coal era in the energy landscape. In 2007, more than 4 million tons of coal entered Narragansett Bay and transited through the SAMP area. The context of industrial shipwrecks, however, can be more tightly defined. During the 1920s structural changes in the transportation of coal and advances in marine safety and navigation greatly reduced, although did not eliminate, the wrecking of coal carrying vessels in the SAMP area. The centralization of coal shipping in Virginia and improvements in the receiving of coal at larger New England ports removed physical and economic roadblocks that prevented investments in safer large capacity coal barges and vessels. As long as waiting times to unload were irregular and often protracted, larger, safer, and more capital-intensive vessels could not compete with the inferior or less expensive vessels whose wrecks line the bottom and shorelines of the Atlantic Coast from Virginia through New England.

Coal dominated the energy landscape, but other fuels and technologies have also had an important presence. While the absolute volume of coal transported through the SAMP has continued high, its relative dominance in New England's energy lifeline began to slowly diminish after 1918 with the rapid increase in the use of oil for fuel. In 1918, the burning of fuel oils produced the equivalent of 8% of the total energy produced by coal in the United States. By 1922, that figure had doubled to 16% and by 1935 reached 21.5% (Schurr 1960). Although coal in vast quantities fueled New England's power plants, it was increasing amounts of petroleum in the form of fuel oil, kerosene, and gasoline that provided energy to heat homes and power the millions of new motor vehicles that were reshaping the country.

In 2007, more than 6 million short tons of petroleum products entered Narragansett Bay via the SAMP area (SAMP Chapter 7). As the 1996 *North Cape* grounding illustrated, the conveyance of petroleum products is an important and potentially dangerous component of the SAMP area's energy cultural landscape. Like coal, the conveyance of petroleum has a unique history, one marked in the landscape by shipwrecks, environmental impacts, and shore facilities. The history of transporting petroleum products by sea, however, differs greatly from coal. It developed quickly and took on a highly rationalized form that included efficient port infrastructures for loading and unloading (Schurr 1960).

Modern tankers first appeared in Europe in the 1880s, with the first American-built tanker launched for Standard Oil in 1888. Tankers became more common with increased use of petroleum for fuel especially with the mass production of the automobile and the skyrocketing consumption of gasoline. In 1918, Americans consumed an estimated 74.5 million barrels of gasoline, a figure that grew 7-fold by 1939, the year that the tanker *Lightburne* ran aground and broke up on Block Island carrying a cargo of gasoline and kerosene (Schurr 1960; Snyder 2001). The *Lightburne* was not the first petroleum-carrying vessel to wreck in Rhode Island. A wreck that may be even more historically significant is the old iron tanker *Llewellyn Howland* that ran aground and broke up on Seal Ledge, dumping thousands of barrels of fuel oil into the SAMP area in 1924 (Snyder 2001). The *Howland's* history is not well known; however, research by URI investigators determined that it is a first generation oil tanker built in 1888, and a very likely candidate for the National Register of Historic Places.

The production and distribution of energy dramatically shaped in the cultural landscape of the Block Island and Point Judith areas. Some of the landscape features such as historic shipwrecks associated with the transportation of coal and petroleum are easy to identify in the historical record and to associate with the energy landscape. The cultural and historical significance of this archaeological landscape is clearly high, but determining specific value of the individual wrecks

that are major components in the landscape will require further research and analysis. At a minimum level, these wrecks are connect with a time in history (1870–1920) when the human footprint on the ocean area seemed more pronounced and its visual characteristics markedly different from 2010. Crossing over to Block Island on a typical day would have presented passengers with the view of an industrial maritime thoroughfare characterized by passage of hundreds of vessels and thousands of people. On land, modern harbors, industrial docks, deepwater navigation channels, and shipping lanes that developed during this period are just a few of the non-shipwreck landscape features that connect in meaningful and *documentable* ways with the area’s energy landscape.

Contemporary plans to develop renewable offshore energy in the Block Island area are a direct continuation of three centuries of energy history. The connection of the proposed wind turbines with Block Island’s power grid would provide the community with a local source of energy that is at one reliable, renewable, and economical--the first since Indian people last controlled the island’s forest resources in the 17th century. Distinctive and new, the proposed towers would become come the latest cultural signature in the area’s evolving energy landscape.

4.2 Submerged Telecommunications Cables

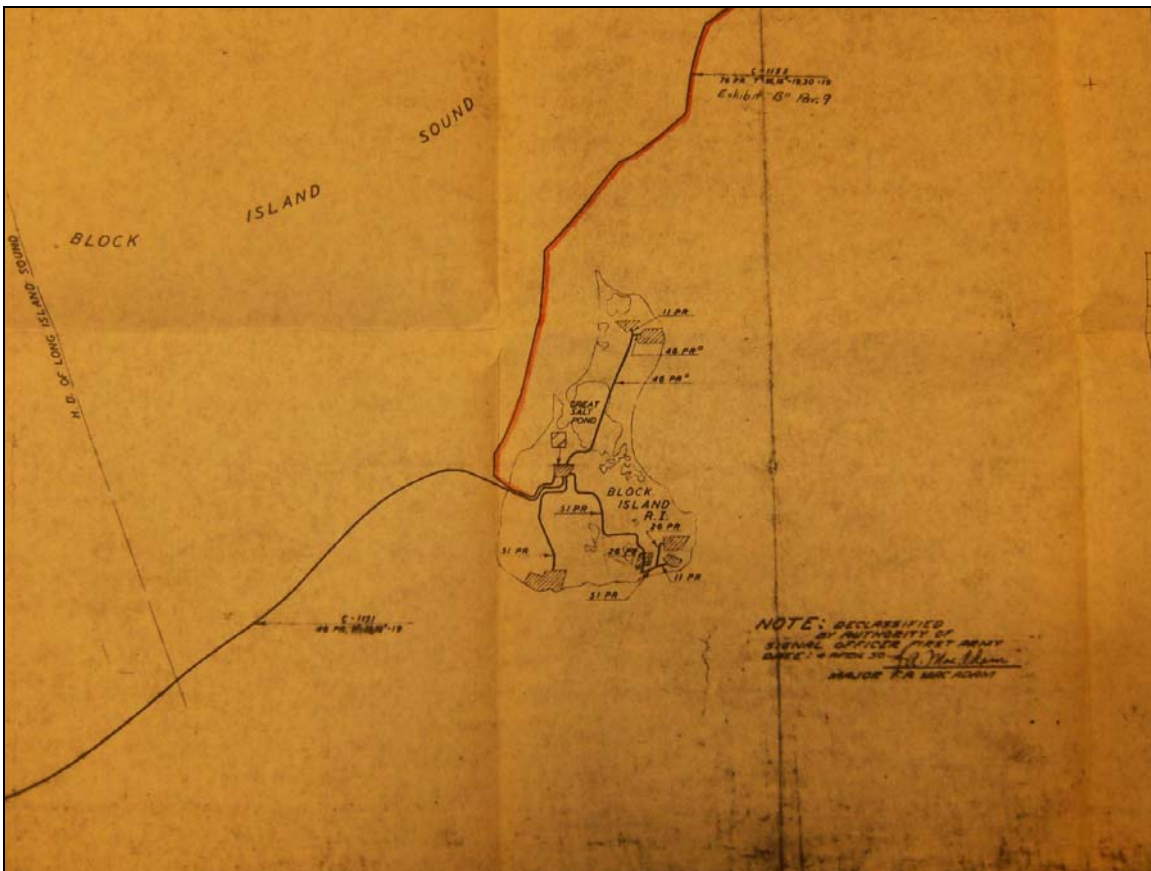
Modern telecommunication cables and corridors are well understood in the Ocean SAMP area. The southern coast of Rhode Island has been heavily utilized in a succession of transatlantic communication cables. Cables currently “in service” include Transatlantic No. 12/13 (TAT-12/13), part of which runs from Green Hill, Rhode Island to Lands End, England; Gemini, part of which runs from Charlestown, Rhode Island to Oxwich Bay, near Swansea, Wales; and FLAG Atlantic 1 which runs from New York to the UK intersecting Long Island Sound and Block Island Sound. “Out of service” cables include Transatlantic No. 5 (TAT-5), part of which runs from Green Hill, Rhode Island to Conil, Spain; Transatlantic No. 6 (TAT-6), part of which runs from Green Hill, Rhode Island St. Hilaire-de-Riez, France; and Transatlantic No. 10 (TAT-10), part of which runs from Green Hill, Rhode Island Norden, Germany. The majority of these cables whether in service or not, run out of Green Hill, RI to the southeast and then south, passing between 3 and 9 nautical miles east of Block Island. The exceptions are TAT-12/13 and FLAG Atlantic 1, which run west of Block Island.

Historic cables, however, are less well understood than their modern counterparts, and under certain circumstances might be considered historic resources. They also present problems for management of development projects. Of particular concern to marine planners in the Ocean SAMP region is the cable area off the southwest coast of Block Island, which runs across Blocks Island Sound to Montauk Point on the eastern end of Long Island. In an attempt to understand the origin of this area and its potential to house historic resources, URI researchers traced the cable laying history of Block Island Sound.

In 1880, Congress appropriated \$15,000 for the US Army Signal Corps to lay the first telecommunications cable from Block Island to the mainland. The work was complete in 1884. Although justified for military communications and the transmittal of weather information, Rhode Islanders clearly saw this as a way to attract Federal dollars for communication infrastructure that would allow connections with the otherwise isolated communities on Block Island. Safety-at-sea was also an immediate concern. Throughout the state’s history, shipwrecks and loss of life-at-sea in the SAMP area had never been higher.

The two-conductor cable ran from Sandy Point at the north end at the Block Island to Narragansett Pier (Annual reports of the War Department, 1899; An Act to Authorize the Laying of a Telegraph Cable from the Main Land in Rhode Island to Block Island, 14 Jan. 1880). Within two years, however, the cable was unserviceable and Congress appropriated an additional \$18,350 to replace it. Lawmakers specifically recognized the importance of the Block Island cable and the role it played in connecting signal stations with life-saving stations and lighthouses. (Statutes of the United States of America, 1885-1886). In March 1888, the cable was rendered unserviceable for a second time. This time, a vessel (possibly the schooner *William Jordan*), that had become stranded some time, broke apart in a springtime storm and severed the cable. By the turn of the century, the signal corps had repaired the cable, but now started to question its military utility and its value for transmitting weather information. Its utility, however, for general telegraph communication, life-saving, shipping, and commerce was still acknowledged. According the Chief Signal Officer of the Army in 1889, the Block Island line, and a similar cable connecting Nantucket with the mainland, were “probably the most valuable of all the sea-coast lines, giving . . .service to about 75,000 people during the hot summer months, and at the same time sending valuable vessel reports.” (Annual Report of the Chief Signal Officer of the Army, 1889). He went on to question, however, the military utility of the cables and hinted at a transfer of ownership and responsibility.

Figure 4. Map Showing De-Accessioning of Communications Cables after WWII (NARA's Northeast Region (Boston), Waltham, MA)



In 1902, the Block Island cable, was transferred to the Weather Bureau, under the Department of Agriculture, on condition that the Bureau maintain it and allow military use of it during war. By this time, the salt-water environment and marine organisms (particularly teredo) had once

again taken their toll on the communication infrastructure. The cable had become so badly deteriorated that the Department of Agriculture requested an appropriation of \$40,000 for a complete replacement. This time guttapercha would be used instead of rubber (Annual Reports of the Department of Agriculture, 1902; A Digest of Opinions of the Judge of the Advocates General of the Army, 1912). The current cable corridors from the north end of Block Island to the mainland stem from these years.

During WWII, as German submarines threatened the Atlantic coast of the United States, the US military renewed its interest in signal stations and communication cables. As a result, the army and navy initiated an extensive cable laying operation, requiring governmental easements over private property on land and the designation of new cable corridors in Rhode Island Sound, Block Island Sound and Narragansett Bay. This cable infrastructure included cables that ran from Fort Greene (then near Point Judith) to Green Hill, and from there onto stations at Charlestown, Noyes Point and Watch Hill. It also included cables from Block Island to Fort Greene (near Point Judith) and Block Island to Montauk Point, Long Island. Block Island's southwest cable corridor originates from this time. Both the Block Island cables were de-accessioned between 1956 and 1957 (Submarine Cable Easements – Narragansett RI, 1957-1958, Record Group 269, GSA, 1922-1997; Submarine Cable Easements – Block Island, RI, 1956-1960, Record Group 121, Records of the Public Buildings Service, 1801-1976) (Figure 4)

4.3 Database Amalgamation and Archaeological Site Distribution Patterns

Attempts to create a master list of Rhode Island shipwrecks, by combining databases and adding geophysical and archival data are still ongoing. Analysis thus far, however, does enable some preliminary findings as to about site and temporal distribution patterns in the Ocean SAMP area.

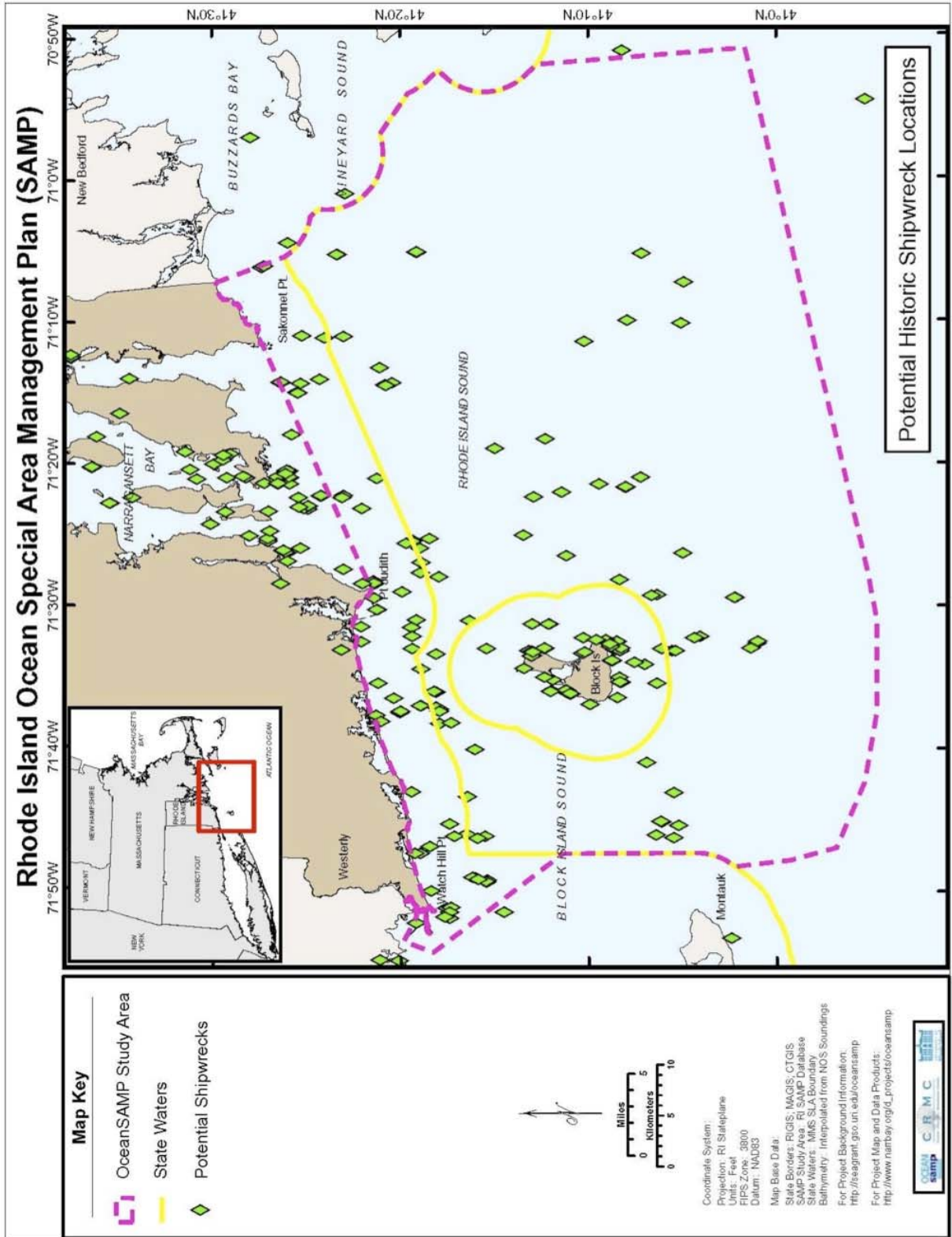
During the last 300 years, there have been at least 1200 maritime accidents and disasters Rhode Island and Rhode Island Sound that probably resulted in vessel loss and/or deposition of cultural material. This number excludes many 17th and 18th century accidents that are much more difficult to track in the historical record. Of the 1200 or more vessels lost in RI waters, approximately half occurred in the SAMP area. Of these, more than half have some locational association with Block Island. Other places strongly represented are the waters off Point Judith, Watch Hill and Beavertail.

It is difficult to know how many of the recorded maritime accidents and disasters left a material record that can be found, studied, protected and analyzed – but it is certainly a significant number. We have good location information for approximately 50 shipwrecks in the SAMP area, but given the number of known wrecks, many others clearly await discovery and assessment. The complete results from all geophysical survey conducted as part of the Ocean SAMP study are not yet available, but when the archaeological processing of that data is complete the RIHPHC will have additional shipwrecks and/or better information in their database. Much of the Ocean SAMP area remains un-surveyed for archaeological sites and important historic resources certainly lie in those areas.

Figure 5 shows the preliminary spatial distribution of Reported Rhode Island Shipwrecks. This data was compiled from multiple database sources, but it is yet to be fully analyzed and consolidated. Not all the shipwrecks have been confirmed and in a few instances the map contains more than one point for an individual shipwreck. Nevertheless, and despite its

weaknesses, the map shows identifiable spatial patterning from which some general conclusions might be drawn.

Figure 5. Potential Historic Shipwreck Locations



Block Island has been a focus of vessel loss in Rhode Island waters. Heavy levels of commercial traffic over the past three centuries combined with strong currents, storms and frequent periods of heavy fog created environment in which shipwrecks on shore and collisions at sea were relatively common. The Ocean SAMP area shows another concentration of shipwrecks in a corridor that runs along the southern edge of the Rhode Island coast from Watch Hill to Point Judith. The lee shore and heavy levels of commercial and passenger traffic during the nineteenth century out of New York and along the southern coast of Connecticut and Rhode Island are largely responsible for this concentration. This heavier concentration, along with dangers to navigation around Block Island, go a long way in explaining higher densities of shipwrecks in the northwestern part of the SAMP area. There is, however, an important caveat. The central-southern and southeastern parts of the SAMP area were further off shore and further away from land observation. Stricken vessels in these areas were less likely to have been seen and less likely to have boasted survivors. In addition, there have been fewer modern attempts to map the ocean floor in the central and eastern parts of the SAMP area. As a result, our knowledge of these areas is less authoritative. They probably contain higher numbers of shipwrecks than are reflected current distribution patterns.

Figure 6. Temporal Distribution of Shipwrecks in the Ocean SAMP Area (Mather, 2010)

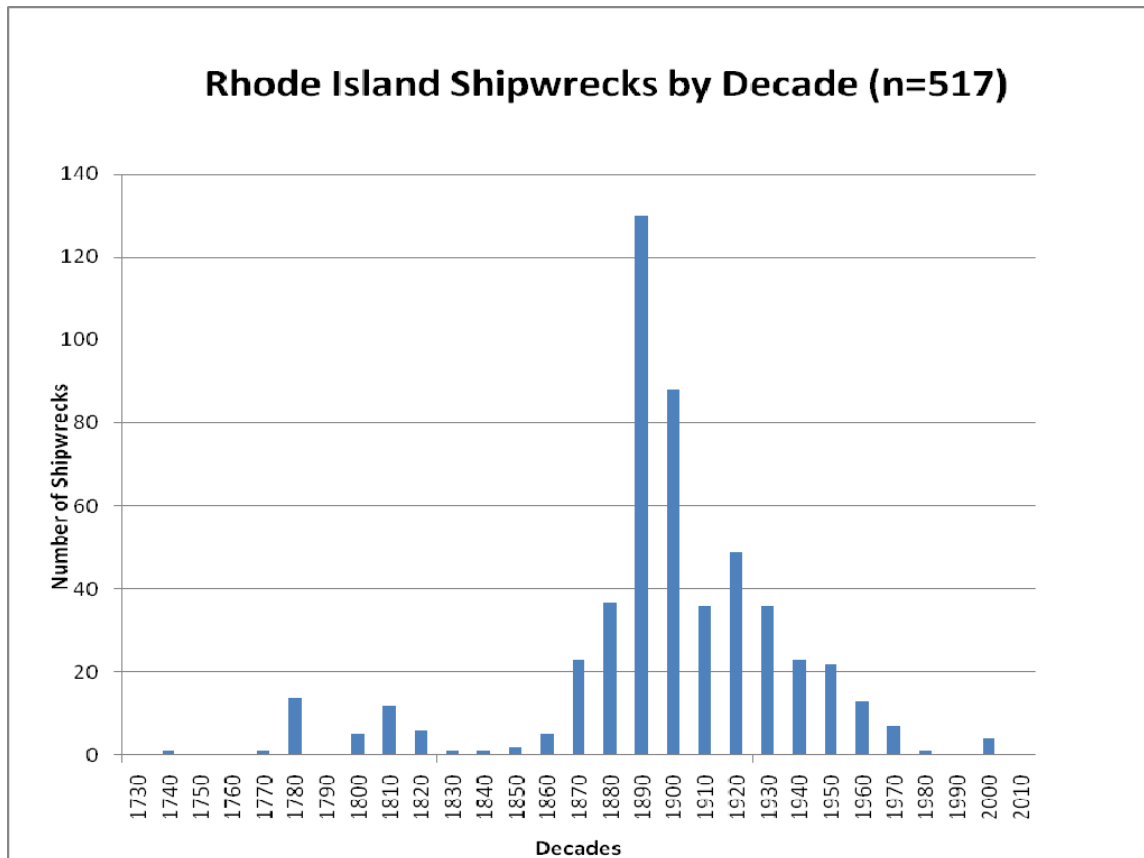


Figure 6 shows the temporal distribution of Rhode Island shipwrecks from the early 18th century to modern times, grouped by decade. The data comes from the URI Working Database, but analyses of other Rhode Island shipwreck databases mirror these results.

The graph shows a spike in the number of Rhode Island shipwrecks during the Revolutionary War and another during the first two decades of the nineteenth century. Starting in the 1860s, Rhode Island saw a sharp rise in the number of shipwrecks occurring in its waters. The numbers continued to rise, reaching their zenith during the 1880s. This certainly resulted from the rapid expansion of shipping activity across the Ocean SAMP area during America’s most rapid period of industrial development. Demands for energy, particularly coal, in New England during the late 19th century caused hundreds of vessels a day to move through the Ocean SAMP area. Heavy traffic, hazardous waters and pre-electronic navigational instruments, provided a recipe for high losses of shipping and life. A decline in the number of shipwrecks per decade in the in the 20th century corresponded with improvements in navigational instruments and greater capitalization of US shipping.

4.4 Archival Research Shipwrecks

The following is a tabular listing of shipwrecks in Rhode Island identified through archival research, primarily at the Regional National Archives in Waltham, MA. There is still more of this work to be done.

Table 1. Shipwrecks in Rhode Island Waters Identified Through Archival Research

| Year | Name | Type | Location | Detail |
|---------|-------------------|------------|-------------------------|----------|
| 1752 | Halifax | Brig | Block Island | Wrecked |
| 1752 | Palatine | Ship | Block Island | Wrecked |
| 1755 | Martha and Hannah | Sloop | Block Island | Wrecked |
| 1780 | Golden Grove | Brig | Block Island | Wrecked |
| 1781 | Mars | Ship | Block Island | Wrecked |
| 1807 | Brutus | | | |
| 1815 | Ann and Hope | Ship | Block Island | Wrecked |
| 1827 | Hannah | | Block Island | Sunk |
| 1829 | Echo | | | |
| 1831 | Warrior | Schooner | Block Island | Wrecked |
| 1838 | J. Palmer | Brigantine | Beaver Tail | Lost |
| 1841 | Fortitude | Sloop | Pt. Judith/Block Island | Sunk |
| 1841 | Forrest | Schooner | Pt. Judith/Block Island | Sunk |
| 1842 | Fortitude | Sloop | | Sunk |
| 1846 | Atlantic | Steamer | Fisher's Island | Wrecked |
| 1849 | Mary Elizabeth | | EastSide Block Island | |
| 1850 | | Schooner | | |
| 1852 | Fellowship | Schooner | Hulls Cove | Lost |
| 1853 | unknown | Schooner | Mackeral Cove | Lost |
| 1853/54 | Lemontine | Brigantine | Beaver Tail | Lost |
| 1855 | Moluncus | Brigantine | Block Island | Wrecked |
| 1855 | Silas Wright | Schooner | Narragansett Pier | Wrecked |
| 1855 | Nelson Harvey | Schooner | Whale Rock | Run Down |
| 1855 | Joseph C. Baxter | Schooner | Fishing Rocks | Wrecked |
| 1855 | William H. Tierce | Schooner | Point Judith | Wrecked |

| | | | |
|----------------------------|------------|-------------------|----------------|
| 1855 North State | Schooner | Point Judith | Wrecked |
| 1855 Tyrall | Schooner | Point Judith | Wrecked |
| 1855 Elizabeth | Sloop | Point Judith | Wrecked |
| 1855 Mary E. McHale | Schooner | Quonochontaug | Wrecked |
| 1855 Issac Webb | Schooner | Noyes Beach | Wrecked |
| 1855 Ere | Schooner | Noyes Beach | Wrecked |
| 1855 Alida | Schooner | Point Judith | Leak, Sunk |
| 1855 unknown | propellor | Green Hill | Sunk |
| 1860 Target | Schooner | Kettle Bottom | Lost |
| 1864 Amelia | Schooner | Point Judith | Wrecked |
| 1864 Normany | Brig | Point Judith | Wrecked |
| 1864 Mary | Schooner | Lions Head | Lost |
| 1866 C.B. Hamilton | Barkentine | Point Judith | Wrecked |
| 1868 Henry Hubbard | Schooner | Block Island | |
| 1869 Sarah L. | Schooner | Point Judith | Wrecked |
| 1869 Spray | Schooner | Narragansett Pier | |
| 1869 Meteor | Brig | Point Judith | Wrecked |
| 1869 unidentified | Schooner | Kettle Bottom | Lost |
| 1869 Chas. E. Raymond | Schooner | Beaver Tail | |
| 1869 Ezra H. Day | Schooner | Whale Rock | Lost |
| 1872 Metis | Steamer | Watch Hill | Sunk |
| 1872 H.T. Hedges | Schooner | Block Island | Refloated |
| 1874 Harriet Lewis | Schooner | Beaver Tail | Wrecked |
| 1874 Express Tilton | Schooner | Beaver Tail | Wrecked |
| 1874 John Morris | Schooner | Narragansett | Wreck |
| 1875 Robin | Schooner | Whale Rock | wreck |
| 1876 Caroline and Cornelia | Schooner | Beaver Tail | Lost |
| 1876 McGee | Schooner | Block Island | Broke Up |
| 1876 Mary Augusta | Schooner | Block Island | Went to pieces |
| 1876 Alfred Hurdle | Schooner | Lion Head | Lost |
| 1877 Caroline Meenaie | Schooner | Block Island | Wrecked |
| 1877 L.M. Lamond | Schooner | Block Island | Wrecked |
| 1877 William S. Scull | Schooner | Block Island | Wrecked |
| 1877 Bayuduce | Schooner | Block Island | Wrecked |
| 1877 Venus | Schooner | Point Judith | Wrecked |
| 1878 unidentified | Schooner | Mackerel Cove | Lost |
| 1878 J.H. Duncan | Schooner | Block Island | Loss |
| 1879 A.E. Hooper | Schooner | Block Island | Wrecked |
| 1879 Alexendra | Schooner | Block Island | Wrecked |
| 1879 Open Sea | Brig | Napatree Point | Sunk |
| 1880 Illinois | Schooner | Point Judith | Wrecked |
| 1880 Joseph Fitch | Schooner | Sugar Reef | Wrecked |
| 1880 Paul and Thomas | Schooner | Fisher's Island | Sunk |
| 1880 Nellie | Brig | Fisher's Island | Sunk |

| | | | |
|-----------------------|------------|-------------------|------------|
| 1880 Franklin Treat | | | |
| 1881 Paladium | Schooner | Point Judith | Wrecked |
| 1881 Calvin F. Baker | Schooner | Block Island | Refloated |
| 1881 Tillie E | Schooner | Point Judith | Wrecked |
| 1881 Lillie | Schooner | Block Island | Loss |
| 1881 John T. Manson | Schooner | Block Island | Refloated? |
| 1881 E. Sinnickson | Schooner | Block Island | Refloated? |
| 1881 | | Block Island | ? |
| 1881 Roda G. | Schooner | Block Island | Loss |
| 1881 Etta M. Story | Schooner | Block Island | Refloated? |
| 1882 Sarah W. Blake | Schooner | Point Judith | Sunk |
| 1882 Manhattan | Barge | Watch Hill | Wrecked |
| 1882 Smith | Schooner | Beaver Tail | Lost |
| 1883 Warren Gates | Schooner | Point Judith | Sunk |
| 1883 Annie Whiting | Schooner | Block Island | Wrecked |
| 1883 Strickland | Schooner | Brenton Reef | Lost |
| 1884 Adrianna | Schooner | Block Island | Loss |
| 1884 S.C. Noyes | Schooner | Block Island | Sunk |
| 1884 Victor | Schooner | Block Island | |
| 1884 Augusta | Brig | Block Island | Refloated? |
| 1884 Nellie B. | Schooner | Block Island | Loss |
| 1884 Julia A. Tate | Schooner | Point Judith | Wrecked |
| 1884 Guard | Brigantine | Watch Hill | Sunk |
| 1884 Clarissa Allen | Schooner | Stonington Point | Sunk |
| 1885 Vrale | Schooner | Watch Hill | Sunk |
| 1885 Bucco | Schooner | Lions Head | Lost |
| 1885 Lizzie D. Barker | Schooner | Block Island | Loss? |
| 1885 Almon Bacon | Schooner | Point Judith | Sunk |
| 1885 Peacedale Woods | | | |
| 1885 Fred A. Carl | Schooner | Watch Hill | Sunk |
| 1885 Mott Haven | Schooner | Point Judith | Sunk |
| 1885 Willie DeWolf | Schooner | Block Island | Sunk |
| 1886 Cleo Chilcot | Schooner | Watch Hill | Wrecked |
| 1886 Lucy Blossom | Schooner | Watch Hill | Sunk |
| 1886 Isabella Jewett | Schooner | West Quague Beach | Wrecked |
| 1886 Wild Pidgeon | Schooner | Block Island | Wrecked |
| 1886 Toronto | Brig | Watch Hill | Wrecked |
| 1886 Mary Natt | Schooner | Point Judith | Sunk |
| 1887 Harry A. Barry | Schooner | Point Judith | Wrecked |
| 1887 Path Finder | Schooner | New Shoreham | Wrecked |
| 1888 William Jordon | Schooner | Block Island | Wrecked |
| 1888 John Welah jr. | Brig | Point Judith | Wrecked |
| 1888 Henry H. Olds | Schooner | Whale Rock | Sunk |
| 1888 Issac Borden | Schooner | Point Judith | Wrecked |

| | | | |
|-------------------------|------------------|-------------------|----------|
| 1889 Alexander Campbell | Bark | Block Island | Sunk |
| 1890 Pocahontas | Schooner | Block Island | Wrecked |
| 1890 Pochohantas | | | |
| 1890 Lady of the Lake | Bark | Block Island | Wrecked |
| 1890 Avenger | Schooner | Watch Hill | Wrecked |
| 1890 Bill Stowe | Schooner | Narragansett Pier | Wrecked |
| 1890 A.H. Hurlburt | Schooner | Narragansett Pier | Wrecked |
| 1890 Carrie A. Lane | Schooner | Napatree Point | Wrecked |
| 1891 Lydia Skolfield | Ship | Newport | Wrecked |
| 1891 A.T. Boardman | Schooner | Block Island | Wrecked |
| 1891 Sunshine | Schooner | Watch Hill | Wrecked |
| 1892 Harry White | Schooner | Quonochontaug | Sunk |
| 1892 Falcon | Catboat | Point Judith | Sunk |
| 1892 Fashion | Sloop | Fort Adams | Sunk |
| 1893 John Paull | Schooner | Green Hill | Wrecked |
| 1893 East Wind | Schooner | Point Judith | Wrecked |
| 1893 Highlander | Brig | Fisher's Island | Lost |
| 1893 Reliance | Barge | Block Island | Lost |
| 1893 Menunctatuck | Schooner | Watch Hill | scuttled |
| 1893 Oliver Chase | Schooner | Point Judith | Sunk |
| 1893 Rapidan | Schooner | Narragansett | Wrecked |
| 1893 Rapidan pontoon 1 | Pontoon | Narragansett | Wrecked |
| 1893 Rapidan pontoon 2 | Pontoon | Narragansett | Wrecked |
| 1893 Rapidan pontoon 3 | Pontoon | Narragansett | Wrecked |
| 1893 Rapidan pontoon 4 | Pontoon | Narragansett | Wrecked |
| 1893 Wm. G.R. Mowry | Schooner | Beaver Tail | Wrecked |
| 1894 Leonessa | Schooner | Watson Pier | Wrecked |
| 1894 L.C. Foster | Schooner | Block Island | Wrecked |
| 1894 scow no. 15 | Scow | Narragansett | Wrecked |
| 1894 scow no. 17 | Scow | Narragansett | Wrecked |
| 1894 Megella | Steam Brigantine | Point Judith | Wrecked |
| 1894 Agricola | Schooner | Napatree Point | Wrecked |
| 1894 Allen | Schooner | Fisher's Island | Wrecked |
| 1894 Red Rover | Sloop | Block Island | Sunk |
| 1895 Olinda (spanish) | Steamer | Fisher's Island | Wrecked |
| 1895 Muriel | Sloop | Watch Hill | Wrecked |
| 1895 Brunhilde | Schooner | Watch Hill | Wrecked |
| 1895 Cora Yacht | Sloop | Brenton Point | Wrecked |
| 1895 Josie F. | Schooner | Napatree Point | Wrecked |
| 1895 unidentified | Catboat | Newport | Wrecked |
| 1895 Evelyn | Schooner | Block Island | Wrecked |
| 1896 Belle R. Hull | Schooner | Watch Hill | Wrecked |
| 1896 Clarissa Allen | Schooner | Point Judith | Wrecked |
| 1896 Water Witch | Brig | Brenton Point | Wrecked |

| | | | |
|---------------------------|------------------|-------------------|-----------|
| 1896 unidentified | Skiff | Newport | Wrecked |
| 1896 Warsteed | Schooner | Quonochontaug | Wrecked |
| 1896 Lady of the Lake | Schooner | New Shoreham | Wrecked |
| 1896 unidentified | Catboat | Point Judith | Sunk |
| 1896 Helen | Schooner | Block Island | Sunk |
| 1896 Zephyr | Schooner | Watch Hill | Wrecked |
| 1896 S.R. Parker | Sloop | New Shoreham | Wrecked |
| 1896 Four Brothers | Schooner | Block Island | Wrecked |
| 1896 Lady of the Lake | Schooner | Block Island | Wrecked |
| 1896 Sea Serpent | Sloop | Block Island | Wrecked |
| 1896 Sharon | Sloop | New Shoreham | Wrecked |
| 1897 Edward M. McLaughlin | Schooner | Point Judith | Sunk |
| 1898 Mary Ellen | Schooner | Point Judith | Sunk |
| 1898 Actress | Schooner | Brenton Point | Sunk |
| 1898 crocodile | Sloop | Quonochontaug | Wrecked |
| 1898 Rose Brothers | Schooner | New Shoreham | Wrecked |
| 1898 Lexington | Schooner | Block Island | Wrecked |
| 1898 Cassie | Sloop | Block Island | Wrecked |
| 1898 Nellie B. | Sloop | Block Island | Wrecked |
| 1898 Arabell | Schooner | Block Island | Wrecked |
| 1898 Aloha | Sloop | New Shoreham | Sunk |
| 1898 Anna Pitcher | Sloop | Block Island | Sunk |
| 1898 Agnes | Schooner | Point Judith | Sunk |
| 1898 Vamoose | Schooner | Block Island | Wrecked |
| 1898 Jonathan Cone | Schooner | Watch Hill | Wrecked |
| 1898 Agnes | | Off of Pt. Judith | |
| 1899 Percy | Schooner | Block Island | Wrecked |
| 1899 Addie M. Anderson | Schooner | Whale Rock | Sunk |
| 1899 New Hampshire | Barge | unkonwn | Sunk |
| 1900 Gertrude | Schooner | Block Island | |
| 1900 Hudson | Barge | Block Island | Foundered |
| 1900 Robert I. Carter | Barge | Block Island | Foundered |
| 1900 Percy | Schooner | Block Island | Foundered |
| 1901 Polas Wave | Fishing Schooner | Block Island | Sunk |
| 1901 J.G. Fell | Schooner | Point Judith | Sunk |
| 1901 Rhode Island | Schooner | Brenton Reef | Sunk |
| 1901 Percy | Fishing Smack | Disabled off BI | Wrecked |
| 1902 no name | Fish boat | Point Judith | Lost |
| 1902 Glance | Catboat | Quonochontaug | Lost |
| 1902 Kate and Mary | Schooner | Quonochontaug | Wrecked |
| 1903 John J. Burkee | Brigantine | Watch Hill | Wrecked |
| 1903 USS Leyden | Tug | New Shoreham | Wrecked |
| 1903 Opitsah | Sloop | Quonochontaug | Wrecked |
| 1903 Due | Sloop | Block Island | Wrecked |

| | | | |
|----------------------------|---------------------|--------------------|-----------------|
| 1903 Jennie R. Dubois | Schooner | New Shoreham | Wrecked |
| 1903 Curlew | Sloop | Point Judith | Wrecked |
| 1904 Louella | Schooner Yacht | Block Island | Lost |
| 1904 Posiedon | Catboat | Point Judith | Sunk |
| 1904 Young American | Sloop | Brenton Point | Sunk |
| 1904 Peggy | Catboat | Block Island | Sunk |
| 1905 George and Albert | Schooner | Brenton Point | Sunk |
| 1905 Moonbeam | Schooner | Point Judith | Sunk |
| 1905 L.M. Eaton | Schooner | Point Judith | Sunk |
| 1905 Maid of the Mist | Catboat | Block Island | Sunk |
| 1906 Edward J. Berwind | Unrigged | Block Island | Sunk |
| 1906 Bouquet | Brigantine | Quonochontaug | Sunk |
| 1906 unnamed | Launch | Green Hill | Sunk |
| 1906 Margie Todd | Schooner | Watch Hill | Sunk |
| 1906 Ailva | Steam Launch | Block Island | Sunk |
| 1906 Auxillary | Sloop | Brenton Point | Sunk |
| 1906 Lugano | Schooner | Point Judith | Wrecked |
| 1906 John Feeney | Schooner | Block Island | Wrecked |
| 1907 Montana | Barge | Block Island | Sunk |
| 1907 Harry Knowlton | Schooner | Quonochontaug | Sunk |
| 1907 Larchmont | Steamer | Quonochontaug | Sunk |
| 1907 Ida | Barge | Point Judith | Sunk |
| 1907 jamie | Barge | Point Judith | Lost |
| 1909 G.A. Hayden | Schooner | Point Judith | Lost |
| 1909 Emily | Catboat | Matunick Beach | Lost |
| 1909 Shawmont | Schooner Barge | Long Is Sound | ? |
| 1909 John S. Bennett | Barkentine | Block Island | Sunk |
| 1909 Herril C. Hart | Schooner | Block Island | Sunk |
| 1911 Sailor | Barge | Block Island Sound | Lost |
| 1911 Armette | Sloop | Point Judith | Lost then saved |
| 1911 Rye | Barge | Point Judith | Sunk |
| 1911 Helen A. Wyman | Schooner Barge | Block Island | Loss? |
| 1911 Vermont | Schooner Barge | Block Island | Loss? |
| 1911 Mary Adelaide Randall | Schooner | Block Island | Loss |
| 1912 Pioneer | Barge | Point Judith | Lost |
| 1914 Helen | Gas Sloop | Narragansett Pier | |
| 1914 J.H. Cooper | Schooner | Point Judith | Lost |
| 1914 St. Daniels | Box Barge | Narragansett Pier | Lost |
| 1914 Luella Nickerson | Schooner | Point Judith | Sunk |
| 1915 Active | Auxilliary Schooner | Block Island | Lost |
| 1916 Francis Mulqueen | Barge | Point Judith | Sunk |
| 1916 St. Daniels | Barge | Point Judith | Sunk |
| 1916 Number 12 | Barge | Pt. Judith | Sunk |
| 1916 Cora | Barge | Point Judith | Sunk |

| | | | |
|-----------------------------|----------------------|--------------------|------------|
| 1917 | Power Skiff | Point Judith | Lost |
| 1917 Madison | Barge | Narragansett Pier | Total Loss |
| 1917 Thomas Edison Mulqueen | Barge | Point Judith | Sunk |
| 1917 Capital City | Barge | Brenton Point | Sunk |
| 1917 Catherine Horan | Barge | Quonochontaug | beached |
| 1917 Madison | Barge | Beaver Tail | Sunk |
| 1917 Chippewa | Barge | Beaver Tail | Sunk |
| 1917 Marion B | Barge | Beaver Tail | Sunk |
| 1918 Henry Failing | Barge | Block Island | Sunk |
| 1921 Barbara W | Schooner | Block Island | Refloated? |
| 1922 Grace Clinton | Schooner | Block Island Sound | Loss |
| 1922 Ino | Schooner | Block Island | Sunk |
| 1945 Nathaniel B. Palmore | Fishing Trawler | Rhode Island | Sunk |
| 1946 unknown poss. E & C | Fishing Boat | Block Island | |
| 1961 Joshua B | Fishing Charter Boat | SW of Block Island | |
| 1970 Julia DaCruz | Fishing Trawler | Block Island | Sunk |

4.5 Analysis of Geophysical Data

The following table comprises the results of cultural resource target analysis for the 2008 *Endeavor* cruise. The ranking corresponds of targets corresponds with the 5-point scale outlined in section 3.5, namely:

1. Certain – the acoustic data alone made it possible to identify the target as a shipwreck or other cultural resource.
2. Probable – the acoustic data was highly suggestive of cultural resources, containing features such as linearity and regular patterning that are commonly associated with shipwrecks of other cultural resources.
3. Possible – the acoustic data has some features that have been reliably associated with cultural resources but might also be indicative of features in the natural world.
4. Unlikely – the acoustic data has features that are normally associated with the natural environment, but may have some features that show regularity and could be cultural in origin.
5. Conceivable – the acoustic data is almost certainly associated with features in the natural world, but could conceivably be cultural in origin.

There were no targets that could be classified as either “1 – Certain” or “2-Probable.” Twelve targets were classified as “3,” nineteen as “4” and twelve as “5.” This is not to say, of course, that cultural resources are absent from the waters off Block Island. We know of, and investigated, shipwrecks sites inshore of the *Endeavor* cruise data, immediately to the east of it, and to the south.

The *Endeavor* data clearly shows a moraine feature to the southeast of Block Island, characterized by scatters and concentrations of rocks. It is often difficult to identify early historic shipwrecks, which typically consist of piles of ballast rock, from this kind of geological background. To date we have found no 17th or 18th century shipwrecks in Rhode Island waters

outside Narragansett Bay. Nevertheless, they almost certainly exist and are certainly historically and archaeologically important.

Table 2. Cultural Resource Target Analysis for Data from 2008 *Endeavor* Cruise

| Line/Data | Ping | Lat. | Long. | Description | Ranking |
|-----------|-------|-----------|-----------|---|---------|
| 278_1204 | 18947 | 41 08.393 | 71 34.328 | Substantial target with some regularity | 3 |
| 278_1907 | 16201 | 41 08.184 | 71 35.537 | Series of regular shaped objects | 3 |
| 278_2112 | 27039 | 41 07.697 | 71 37.816 | Round object | 5 |
| 278_2238 | 10282 | 41 07.721 | 71 37.525 | Series of circles in linear fashion | 4 |
| 279_0315 | 20443 | 41 07.508 | 71 37.492 | Possibly linear | 5 |
| 279_1415 | 10440 | 41 07.544 | 71 34.345 | Substantial target with an associated linear object | 3 |
| 279_1415 | 35832 | 41 06.785 | 71 39.764 | Very long linear feature, but data collected on the turn | 3 |
| 279_1659 | 12223 | 41 07.314 | 71 34.806 | Linear feature | 3 |
| 280_0545 | 14608 | 41 06.887 | 71 35.271 | Small feature with some regularity | 4 |
| 281_1041 | 24964 | 41 06.572 | 71 35.118 | Probably lg rock, some regularity | 4 |
| 281_1230 | 14884 | 41 06.641 | 71 33.922 | Regular shaped rock scatter | 5 |
| 281_1528 | 34840 | 41 06.644 | 71 33 033 | Two regular rock scatters | 4 |
| 281_1732 | 10583 | 41 06.635 | 71 33.012 | Rock pile and bump on ocean floor | 4 |
| 281_1732 | 38828 | 41 05.564 | 71 40.250 | Small isolated distortion with some relief and linearity | 4 |
| 281_1909 | 3600 | 41 05.622 | 71 40.277 | Small isolated distortion with some relief | 4 |
| 281_1909 | 28064 | 41 06.351 | 71 34.188 | Probable rock scatter | 5 |
| 281_2054 | 13840 | 41 06.437 | 71 33.429 | Single object, some linearity and relief | 4 |
| 281_2054 | 23664 | 41 06.096 | 71 35.600 | single linear object | 5 |
| 281_2240 | 46755 | 41 06.901 | 71 30.332 | Small object, fairly hard return, some relief | 5 |
| 282_0515 | 287 | 41 07.631 | 71 38.135 | Small object, probably a rock, but with considerable relief | 4 |
| 282_0539 | 4134 | 41 08.462 | 71 37.779 | Pile of rocks, probably geological | 5 |
| 282_0604 | 9987 | 41 09.276 | 71 37.436 | Interesting scatter, possible scower marks, likely geological | 5 |
| 282_0632 | 9993 | 41 07.828 | 71 38.184 | Semi-circular and in parts linear | 4 |
| 282_0703 | 669 | 41 07.709 | 71 38.414 | 3 objects, some relief, probably geological | 5 |
| 282_0703 | 2635 | 41 08.039 | 71 38.221 | Dark object, considerable relief, probably two rocks | 5 |
| 282_0934 | 7783 | 41 05.757 | 71 37.748 | Fairly substantial linear feature, with some relief | 3 |
| 282_0934 | 22467 | 41 06.177 | 71 34.287 | Rock scatter, probably geological | 5 |
| 282_1108 | 28829 | 41 05.803 | 71 36.831 | Small linear object | 4 |

| | | | | | |
|----------|-------|-----------|-----------|---|---|
| 282_1756 | 4153 | 41 06.410 | 71 31.451 | Possible linear feature, no relief, possibly cable | 4 |
| 282_1756 | 31615 | 41 05.406 | 71 39.127 | Possible linear feature in the sand waves | 4 |
| 282_1913 | 7488 | 41 05.431 | 71 37.497 | Possibly two linear features | 4 |
| 282_1913 | 8569 | 41 05.468 | 71 37.183 | Linear feature | 4 |
| 282_1913 | 9901 | 41 05.525 | 71 36.792 | Linear feature | 4 |
| 282_2206 | 14901 | 41 05.913 | 71 34.045 | Scatter of small dark regular features | 4 |
| 282_2343 | 11250 | 41 06.039 | 71 32.549 | Possible linear feature, in area of sand waves, some relief | 3 |
| 282_0113 | 21778 | 41 05.910 | 71 32.819 | Small linear feature | 4 |
| 282_0113 | 27764 | 41 06.067 | 71 31.346 | Isolated feature, probably geological | 5 |
| 283_0230 | 9270 | 41 05.939 | 71 32.302 | Feature with substantial regular edge | 3 |
| 283_0230 | 13935 | 41 05.835 | 71 33.316 | Small isolated linear feature | 4 |
| 283_0729 | 13193 | 41 05.540 | 71 32.953 | First in a series of three linear features | 3 |
| 283_0729 | 13450 | 41 05.540 | 71 33.012 | Second in a series of three linear features | 3 |
| 283_0729 | 13689 | 41 05.532 | 71 33.065 | Third in a series of three linear features | 3 |
| 283_0729 | 20626 | 41 05.347 | 71 34.599 | Two substantial linear parallel lines with some relief. In among sand waves | 3 |

4.6 Site Specific Investigations

Site-specific investigations are discussed in the order that the fieldwork took place.

4.6.1 *Green Arrow*

On December 22, 1996, the Rhode Island fishing trawler *Green Arrow* ran aground near the Southeast Light on Block Island. Earlier that day, she had departed Point Judith on her way to fishing grounds south of Block Island. It is unclear whether the crewman on watch at the time had been asleep, or whether he had gone below to check the engine.

We encountered the remains of the *Green Arrow* during our pedestrian survey along the southern shore of Block Island (Figure 7). The most prominent feature of the site is part of the stern of the ship with the net reel and parts of the winches. A little further away is a smaller part of the ship's hull. Most of the *Green Arrow* washed away or scattered over the ocean floor.

Figure 7. Remains of the Trawler *Green Arrow*.



4.6.2 *Montana*

On January 20, 1907, a fierce storm with 50 mile-an-hour winds was brewing off the coast of southern New England. Out at sea, the steam tug *Buccaneer* passed Montauk Point headed to Providence, Rhode Island, with two schooner barges in tow: the 242' *Ash* followed by the 165' *Montana*. The *Montana* had been a graceful sailing vessel built in Port Gilbert, Nova Scotia in 1870, but like many of her type, had been converted into a coal-carrying barge toward the end of the 19th century.

About 10 miles northeast of Montauk Point, the *Ash* took on so much water that she started to sink. The *Buccaneer* cut the tow cable and rescued, with great difficulty, the *Ash*'s captain, family and crew. Likewise, the *Montana* severed her tow cable with the *Ash* so as to avoid being taken down. The vessel drifted helplessly in the violent waters waiting for the tug to re-establish a tow. The *Montana*, however, was taking on so much water that her crew eventually anchored and abandoned ship. The vessel sank off the western Block Island coast on 21 January 1907.

The reported site of the *Montana* is about ¼ mile outside the entrance to Old Harbor. Water depth is between 85'-90'. Reconnaissance operations at the site revealed a small echo-sounder feature the seafloor at her reported location. No dive operations were undertaken here. The site is close to the navigation corridors into and out of Old Harbor, but the water depth makes it traffic impact on the wreck unlikely.

4.6.3 *USS Leyden*

The USS *Leyden* was a navy steam tug, 137' in length, built in 1865 and lost on the southern coast of Block Island on January 21, 1903. She had served first at Boston Navy Yard, then at Portsmouth (New Hampshire) Navy Yard and then finally at Newport Torpedo Station. During the Spanish American War she had been involved in operations off Cuba. In January 1903, she was on route from Puerto Rico to Newport. Off the coast of Block Island, her captain Lieutenant Chester Wells ran into a bank of thick fog. Believing that he was further east than he was, Wells set course for Point Judith. This navigation error brought the *Leyden* onto the rocks approximately 1 mile west of the Southeast Light.

The reported location of the USS *Leyden* is about 200 yards off the southern coast of Block Island in about 10-15 feet of water. The little articulated hull structure remaining includes some iron frames, wood deck, screw propeller and part of the machinery. Multiple large rocks surround the wreck.

Our side scan sonar survey of shallow waters along the southern coast of Block Island included the area in the vicinity of the USS *Leyden*. However, large rocks masked the site and prevented us from approaching it. As a result, the sonar survey did not detect an acoustic signature from the USS *Leyden*. We did not conduct dive operations on the wreck.

4.6.4 *Meteor*

In July 1926, the 3,500 ton, 254' long steam collier *Meteor* headed out of Norfolk, Virginia to Boston. Enjoying clear weather until passing Block Island where the vessel encountered dense fog. A navigation error brought the collier onto the shore near Cat Rock Cove, close to the southwest point of the island. A salvage company made a failed attempt to drag the ship off the rocks.

The remains of the *Meteor* are in very shallow water just to the north of southwest light, Block Island. All that remains of the site are some elements of her boiler and machinery. Our side scan sonar survey of the shallow waters along the southern coast of Block Island included the area in the vicinity of the *Meteor*. However, shallow water prevented us approaching wreck close enough to obtain an acoustic signature. We did not conduct dive operations on the wreck.

4.6.5 *Spartan*

In the afternoon of March 18, 1905, the steam freighter *Spartan*, owned by the Boston and Philadelphia Steamship Company, headed out of Providence and down Narragansett Bay for Philadelphia. She was 220' long, 1596 tons and carried a general cargo, including textiles. As she headed out to sea, dense fog set in and a navigational error brought her onto the shore between Old Harbor and Southeast point, Block Island. She was steaming due west when she ran into the island. A salvage company rescued some of the cargo, but could not save the vessel.

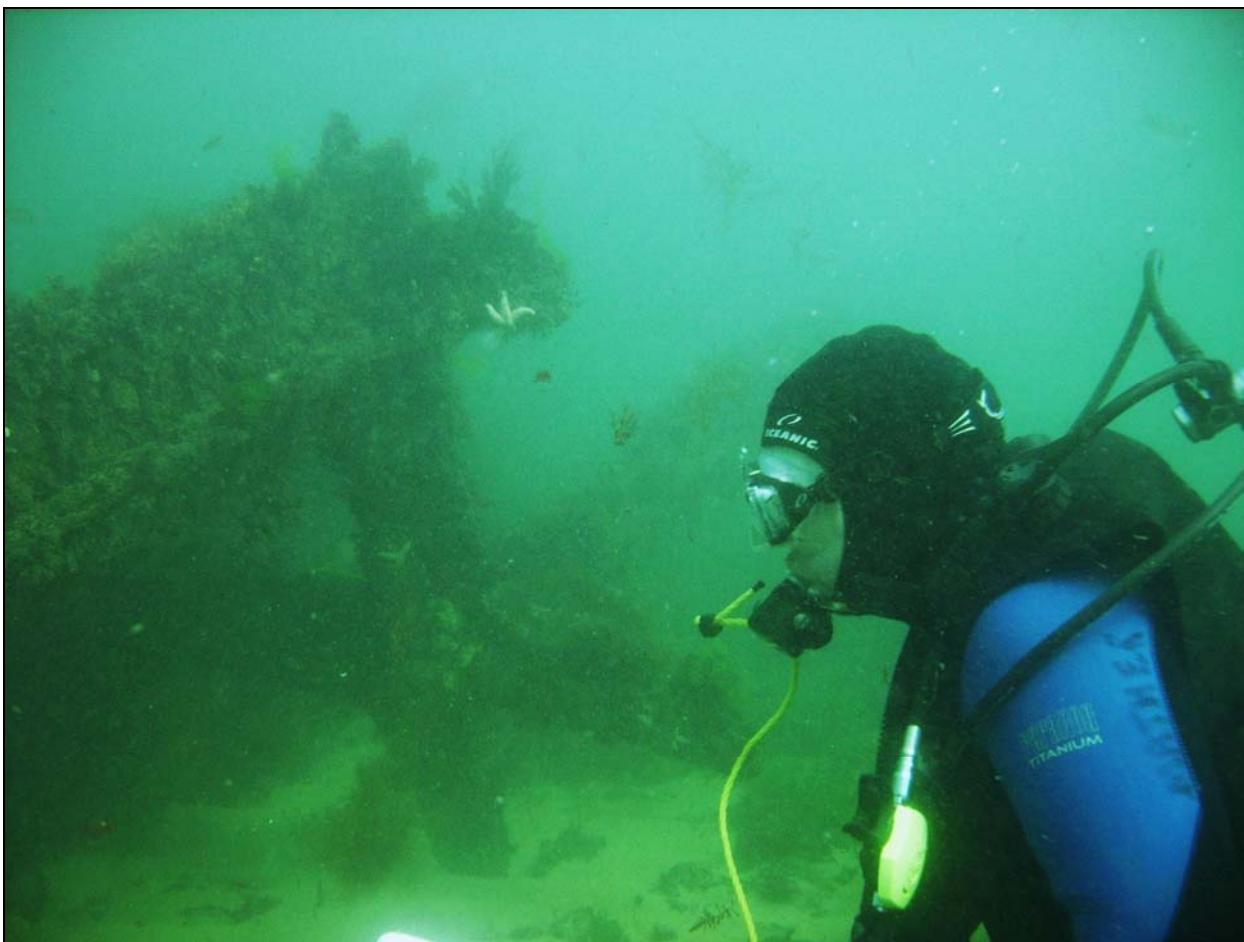
The remains of the *Spartan* are close to shore in very shallow water, about three quarters of a mile north of the Southeast Light, Block Island. Elements of the ships power plant and propulsion systems are present at the site. Our side scan sonar survey of the shallow waters along the southern coast of Block Island included the area in the vicinity of the *Spartan*.

However, shallow water prevented us from getting close enough to obtain an acoustic signature. We did not conduct dive operations on the wreck.

4.6.6 *Lightburne*

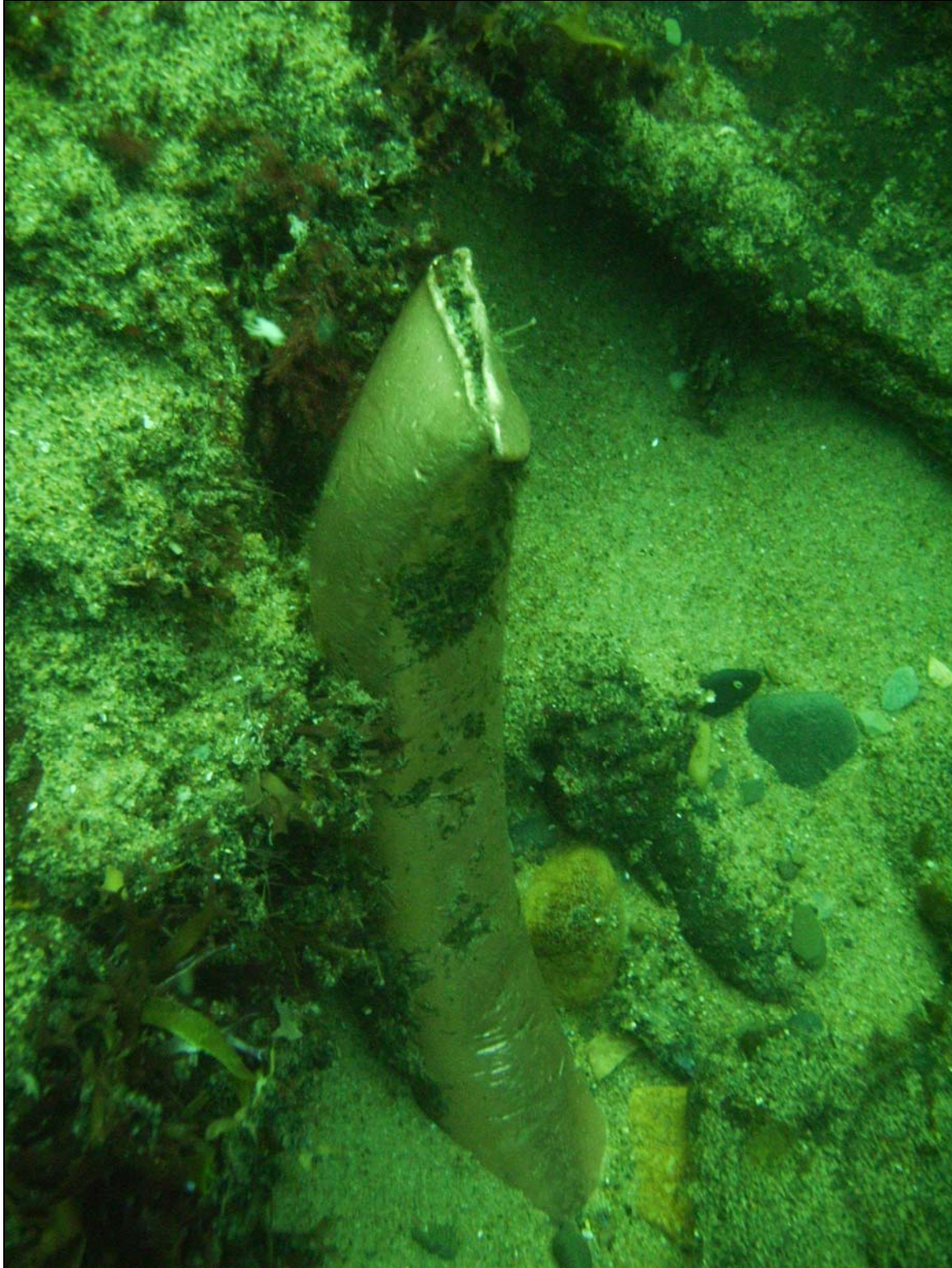
The tanker *Lightburne*, built in Bath Maine in 1919, was a little over 431' long and 6,429 gross tons. While on route from Port Arthur, Texas to Providence on 10 February 1939 she encountered a dense fog and went aground right below the Southeast Light, Block Island. Several vessels came to the aid of the *Lightburne*, but poor visibility and heavy seas prevented them from coming along side. After several hours, a Coast Guard lifeboat evacuated the captain, crew and the ship's dog. The following day, some of the tanker's cargo of gasoline ignited and burned for several hours. The crew subsequently returned to the vessel to salvage personal possessions and a professional salvage company took off some of the remaining gasoline.

Figure 8. Examining the Structural Remains of the *Lightburne*



The remains of the *Lightburne* were readily identifiable in our side scan sonar survey of the shallow waters along the southern coast of Block Island. The wreck is located inside navigation marker and close to the wreck of the *Essex*. We conducted an archaeological assessment of the site and recorded evidence of anthropogenic effects. We documented the site with both video footage and still imagery (Figure 8).

Figure 9. Evidence of Looting at the *Lightburne*.



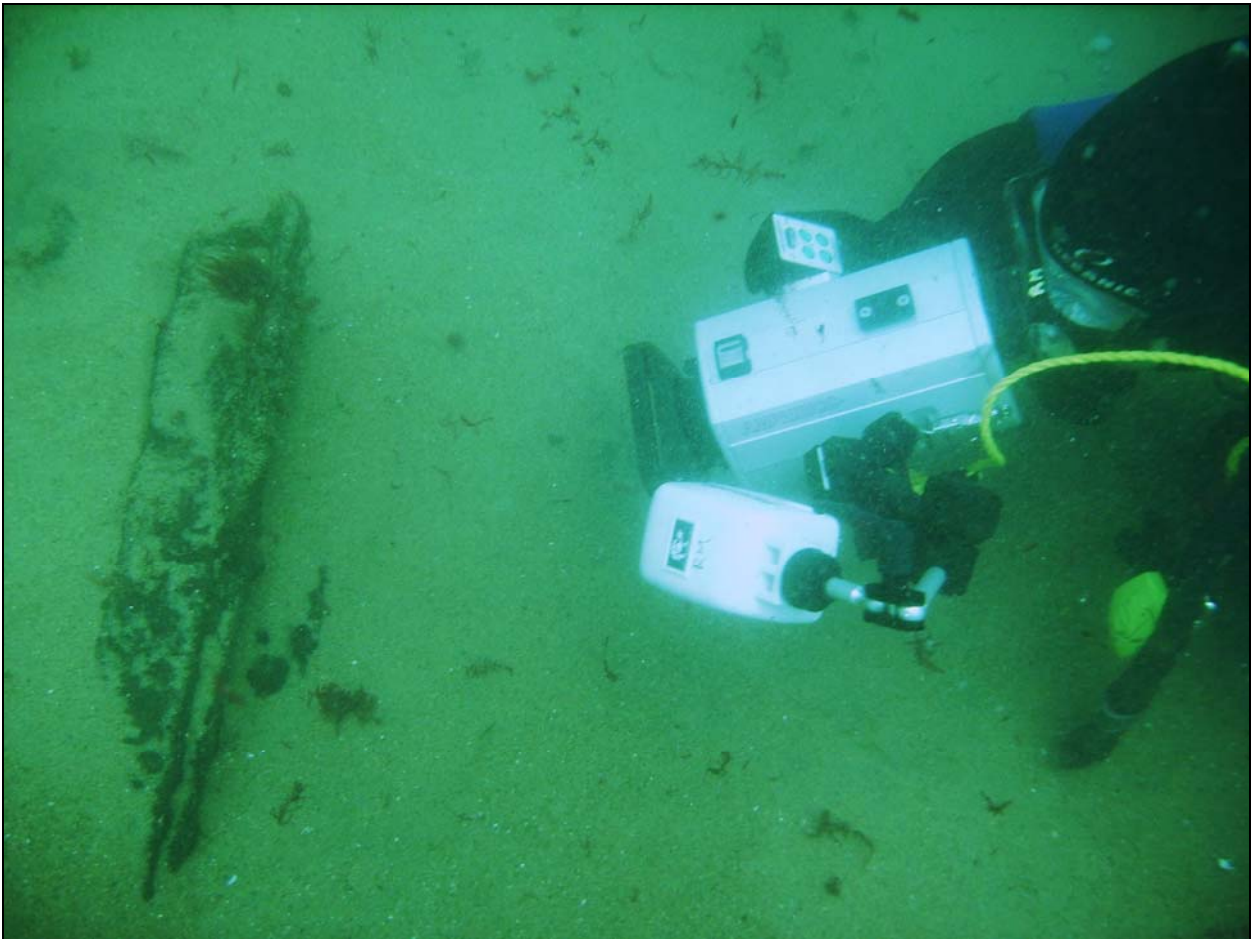
The *Lightburne* sits in approximately 25' of water off the Southeast Light. The wreckage is spread out over at least 400'. The most prominent features of the site are elements of the wreck's superstructure which including a series of transverse bulkheads that rise as much as 15' from the bottom. Much of the hull plating is gone. There are still some parts of the ship's

machinery present at the site. Sports divers frequent the site, and while few artifacts remain on the surface, there is some evidence of looting. In at least two places, brass pipes and fittings have been removed using substantial hand held cutting tools (Figure 9). Some sports fishing gear is located at the site, but no commercial fishing gear of note. The *Lightburne* is located in a high-energy environment

4.6.7 *Essex*

Built by William Cramp & Sons in Philadelphia in 1890, the steel-hulled, passenger-freighter *Essex* was 272' long and 3,018 tons. In 1940, she was sold to the White Pearl Shipping Corporation for use almost exclusively as a freighter. On her first voyage under new ownership, a passage from Lisbon to New York, she ran aground on Block Island, very close to the *Lightburne*. The *Essex* ran aground during the evening of September 25, 1941 under peculiar circumstance of calm water and clear weather. The vessel's captain claimed to have hit a floating object that caused the *Essex* to take on water. Rather than sink in open water, the captain claimed that he ran the vessel ashore. An alternative version of the accident suggests that the captain accidentally ran the vessel ashore. After backing her off, the *Essex* started taking on water, forcing the captain to run her ashore a second time. Salvage efforts enjoyed partial success, before a subsequent storm broke up the ship and scattered her wreckage.

Figure 10. Iron Debris from the *Essex*



The remains of the *Essex* were readily identifiable in our side scan sonar survey of the shallow waters along the southern coast of Block Island. The wreck is located inside a navigation marker and close to the wreck of the *Lightburne*. We conducted an archaeological assessment of the site and recorded evidence of anthropogenic effects. We documented the site with both video footage and still imagery.

The *Essex* sits in approximately 25' of water off the Southeast Light. The wreckage comprises several large pieces of hull structure and an associated debris field. The large structural elements contain iron frames and wooden planking. At least one section appears to include part of the ship's deck, within which there is evidence of a hatch and companionway. Some of the hull structure is flush with the sand, while other elements rise at least 7' from the bottom. The wreckage is dispersed out over at least 250'. Surrounding the main structural elements is a debris field that contains pieces of iron, including iron plating (Figure 10). The *Essex* is located in a high-energy environment. We did not observe evidence of looting. Neither was there evidence of commercial fishing gear.

4.6.8 *Idene*

The *Idene* was a 120' Rhode Island eastern-rigged fishing trawler deliberately sunk approximately 4 miles south of Block Island in 1991. Declared obsolete by her owners some years earlier, the *Idene* was scuttled after rusting at a Snug Harbor dock for several years.

The *Idene*'s proximity to possible locations for off shore wind turbines rendered her of particular interest in these site-specific studies. We used side scan sonar to establish good coordinates for the wreck. We then conducted an archaeological assessment of the site and recorded evidence of anthropogenic impacts. We documented the site with both video footage and still imagery.

The *Idene* sits in approximately 85' of water, 4 miles south of Block Island. In water visibility was not good during our dives. The site supports a rich variety of sea life including anemones, tautog, bluefish, Pollock and blue sharks. Although intact, a crack runs through the hull just aft of the forward mast. The mast is still standing, the bow is virtually complete and the deck has at least two open hatches each with ladders leading down to cargo holds. Toward the stern, the sport divers who regularly visit the site easily penetrate the intact pilothouse. The *Idene* site houses few artifacts or structural element that would attract serious looting. We observed some sports fishing gear on the site but no commercial nets.

4.6.9 *Endeavor* Cruise Targets

While the *Endeavor* cruise produced no targets that could be identified as "1-Certain" or "2-Probable" cultural resources, 12 targets were ranked as "3-Possible." After careful review, SAMP researchers selected two of these for groundtruthing by scuba-equipped archaeologists.

Target 278_1204_18947 was identified in the *Endeavor* acoustic data as a substantial target, fairly close to the Block Island shore, with some regularity. The target was re-acquired using the Edgetech 272 tow fish, marked and investigated. Water depth at the site was approximately 25 feet. The source of the signature was a substantial rock pile.

Target 282_0934_7783 was identified in the *Endeavor* acoustic data as fairly long linear feature with some relief, located toward the shoal water southwest of Block Island. The target was re-acquired using the Edgetech 272 tow fish, marked and investigated. The source of the signature was a series of linear arrangements of rock. Water depth at the site was approximately 45-50 feet.

With additional field time, the archaeological team would have investigated at least three other targets, all of which had some features that could have been associated with cultural resources.

5 Conclusions

Field investigations conducted as part of this study have provided insight into Rhode Island's rich cultural heritage. The shallow hazardous waters along Block Island's southern coast have been the loci for numerous wrecks over the past 300 years. As such they are particularly archaeologically sensitive. Clay Head, Old Harbor and Black Rock are similarly sensitive. Shipwrecks certainly exist further off shore, and some are close to areas of potential wind farm development. The earliest, and in some cases archaeologically most sensitive shipwrecks, are also the most difficult to find. Wrecks from the 17th and 18th century undoubtedly exist in Rhode Island Sound, but to date none have been found.

The Ocean SAMP project has potentially opened a new door in the study and management of Rhode Island maritime and coastal cultural heritage. The study of Block Island and the surrounding region's maritime archaeology has begun to reveal a greater richness and complexity in the Ocean State's cultural heritage. Although far from comprehensive, the project looked at cultural heritage using a Cultural Landscape Approach (CLA). Looking at the ways different people and different cultures have interacted with marine environments underscored heritage elements common to all Rhode Islanders while recognizing the special and unique connections that Indians, fishermen, military personal, and sailors, among others, have had with ocean landscape and its resources.

From a policy standpoint, cultural heritage remains an uneasy fit with many professionals involved in marine spatial planning. This is not unique to Rhode Island. In some respects, the Ocean SAMP has brought real improvement. However, gaps in our knowledge and understanding threaten cultural heritage resources. While the destruction of archaeological resources may be avoided by applying the data collected in this study - real progress will come with the embrasure of perspectives such as CLA that integrate Rhode Islands cultural and natural heritage. The cultural signatures, material resources, recorded and oral history offer underused or untapped sources for understanding the condition of marine and coastal ecosystems and how it relates to culture and human behavior.

In our view, applying CLA to the study, management, and public interpretation of coastal and marine heritage resources offers the best chance to take Rhode Island to the forefront of effective marine spatial planning and pubic marine archaeology. This report and the historical research and survey work were informed by CLA. Developing the data required to intensively document the broad sweep of Rhode Island's marine cultural landscapes will require far more time and effort that could be marshaled here. Despite its limited scope, the project yielded important new insights into Rhode Island maritime history and marine archaeology as well as advancements in the theory and practice of cultural heritage management in an age of marine spatial planning.

By taking a cultural landscape approach, we identified an archaeologically rich and historically significant set of resources - the shipwrecks and landscapes associated with the gathering and movement of energy. The connections between early use and exhaustion of wood resources on Block Island and current efforts to construct renewable energy wind towers near by are neither coincidence nor forced. The quest for reliable energy transformed the Block Island landscape. A century later, this same quest, when undertaken at the regional and national scale, provided tens of thousands of seafaring jobs and, as the historical and archaeological record reveals, to innumerable tragedies - many in Rhode Island. The density of maritime traffic support this trade created a rich archaeological record that the coast planner will have to take into careful account.

Far from fully developed, but of more contemporary significance, the region's fisheries history has resulted in a connected archaeological and cultural legacy that spans millennia. The economic and technological transformations in commercial fishing during the nineteenth and twentieth centuries dramatically changed local ecosystems. They have also supported generations of fishing families. As present conditions cloud the futures of fish and fishermen in Rhode Island, it seems essential to recognize, study, and where appropriate preserve the material culture and living memories of the a crucial and historic group of harvesters. For many, the loss of vessels and lives out of ports such as Pt. Judith seem contemporary and immediate—yet what is going on now represents the last chapters in the lives of many potentially historic vessels. Local shipwrecks of fishing boats, many of them unbound, are also memorial sites to the living relatives of many of the states lost mariners. Fishing, we suggest, is one of most at risk and important cultural landscapes in Coastal Rhode Island.

Another overwhelming and perhaps less surprising conclusion involved the extraordinary effects of military activity in shaping cultural landscapes. From countless shore properties to warships ranging from the Revolutionary War to World War II, conflict has created intensive activity and left profound cultural marks. As with any historic landscape, not everything reflects glory or is worth preserving. State bottomlands are covered in places with ordinance and varying kinds of military refuse.

The cultural landscape approach to management we advocate does not call for the preservation of every historic structure or object. It requires looking closely at all of the material culture found in or along the ocean floor. These materials are a record of human interaction with the environment and not simply memorials to human achievement. The place-based contexts prescribed by Marine Spatial Planning offer an appropriate geographic scale for studying and applying the knowledge derived from our cultural heritage.

References

- A Digest of Opinions of the Judge Advocates General of the Army, 1912.* 1917. Washington: Government Printing Office.
- Abbass, D. K. 2000. *Naval History and the Submerged Cultural Resources of Rhode Island, Volume I.* Newport, RI: Rhode Island Marine Archaeology Project.
- A.R. Alanen and R.Z. Melnick, 2000. "Why Cultural Landscape Preservation," in Alanen and Melnick, eds., *Preserving Cultural Landscapes in America.* Baltimore; The Johns Hopkins University Press.
- Albion, R. G., Labaree, B. W. and Baker, W. A. 1970. *New England and the Sea.* Mystic, CT: Mystic Seaport Press.
- Annual Reports of the War Department for the Fiscal Year Ended June 30, 1899.* 1899. Washington: Government Printing Office.
- Annual Report of the Auditor of the Railroad Accounts made to the Secretary of the Interior for the Year Ending June 30, 1880.* 1880. Washington: Government Printing Office.
- Annual Report of the Chief Signal Officer of the Army to the Secretary of War for the Year 1888.* 1889. Washington: Government Printing Office.
- Annual Reports of the Department of Agriculture for the Fiscal Year Ended June 30, 1902.* 1902. Washington: Government Printing Office.
- Atlantic Deeper Waterways Association. 1908. *First Annual Convention Held at Baltimore November 17, 18, 19 1908: Report of the Proceedings.* Philadelphia: Atlantic Deeper Waterways Commission.
- Bartlett, John Russell, 1858. *Records of the Colony of Rhode Island and Providence Plantations in New England.* Providence: Knowles, Anthony & Co.
- Birnbaum, C. 1994. *Preservation Brief 36. Protecting Cultural Landscapes: Planning, Treatment, and Management of Historic Landscapes.* National Park Service.
- Bridenbaugh, Carl, 1974. *Fat Mutton and Liberty of Conscience, Society in Rhode Island, 1636-1690.* Providence, RI: Brown University Press.
- Cameron C. and M. Rossler, 1995. "Global Strategy: Canals and Cultural Routes," *World Heritage Newsletter* 8.
- Carroll, Charles. 1932. *Rhode Island: Three Centuries of Democracy.* New York: Lewis Historical Publishing Company.
- Coleman, Peter J. 1963. *The Transformation of Rhode Island 1790 – 1860.* Providence: Brown University Press.

- Cooper, David J. and John O. Jensen. 1995. *Davidson's Goliaths: Underwater Archaeological Investigations of the Steamer Frank O'Connor and the Schooner-Barge Pretoria*. Madison: State Historical Society of Wisconsin.
- Cronon, William. 1983. *Changes in the Land: Indians, Colonists and the Ecology of New England*. Hill and Wang.
- DeAlteris, J.T.; Gibson, M.; Skrobe, L.G. 2000. Fisheries of Rhode Island (Working Draft). Narragansett Bay Summit 2000: White Paper.
- Egan, D. 2003. "Defining Cultural and Ethnographic Landscapes: A Primer for Understanding National Park Service Cultural Resource Management Terminology," *Ecological Restoration* 21.
- Fagan, Brian. 2006. *Fish on Friday: Feasting, Fasting and the Discovery of the New World*. New York: Basic Books.
- Fowler, William M. 1976. *Rebels Under Sail: The American Navy during the Revolution*. New York: Charles Scribner's Sons.
- Fry, G. 2001. "From Objects to Landscapes In Natural and Cultural Heritage Management: A Role for Landscape Interfaces," in H. Palang and G. Fry, eds., *Landscape Interfaces: Cultural Heritage in Changing Landscapes*. Boston: Kluwer Academic Publishers.
- Gasner, Pamela. 2008. "Structures and Sites from 1680 – 1948 on Block Island/Town of New Shoreham" Block Island Historical Society.
- Goode, G. Brown. 1884. *The Fisheries and Fishing Industries of the United States, Section II*. Washington, DC: Government Printing Office.
- Gordon, Richard L. 1978. *Coal in the U.S. Energy Market: History and Prospects*. Lexington: D.C. Heath.
- Graebner, William. 1974. "Great Expectations: The Search for Order in Bituminous Coal. 1890 – 1917." *The Business History Review*. Vol. 48: 49 – 72.
- Hale, Stuart O. 1998 (updated ed.). *Narragansett Bay: A Friend's Perspective*. University of Rhode Island Marine Advisory Service NOAA/Sea Grant Marine Bulletin 42.
- Harbors of Refuge at Point Judith, Block Island, and Great Salt Pond, etc.* 1903. 55th Cong. 2nd Sess. H. Doc 60.
- Hearings before the Committee on Expenditures in the Department of Agriculture, House of Representatives*. 1907. Washington: Government Printing Office.
- Hall-Arber M, Dyer C, Poggie J, McNally J, Gagne R. 2001. New England's Fishing Communities. Cambridge (MA): MIT Sea Grant 01-15. Available from: <http://seagrant.mit.edu/cmss/>

- Hawes, Alexander Boyd. 1999. *Off Soundings: Aspects of the Maritime History of Rhode Island*. Chevy Chase, MD: Posterity Press.
- Hearings before the Committee on Expenditures in the Department of Agriculture, House of Representatives*. 1907. Washington: Government Printing Office.
- Howett, C. 2000. "Integrity as a Value in Cultural Landscape Preservation," in *Preserving Cultural Landscapes in America*. A.R. Alanen and R.Z. Melnick, eds. Baltimore: The Johns Hopkins University Press.
- Hunter, Louis C. 1979. *A History of Industrial Power in America*. Volume One: Water Power in the Century of the Steam Engine. Charlottesville: University of Virginia Press.
- Hunter, Louis C. 1985. *A History of Industrial Power in America*. Volume Two: Steam Power. Charlottesville: University of Virginia Press.
- Jones, Daniel P. *The Economic and Social Transformation of Rural Rhode Island, 1780-1850*. Boston MA: Northeastern University Press.
- Keatts, Henry and George Farr. 2002. *The Bell Tolls: Shipwrecks and Lighthouses, Volume 1, Block Island*. Laurel, NY: Main Road Books.
- Kellner, G. H. and Lemons, J. S. 2004. *Rhode Island the Ocean State: An Illustrated History*. Sun Valley, CA: American Historical Press.
- Labaree, B. W., Fowler, W. M. Jr., Sloan, E. W., Hattendorf, J. B., Safford, J. J., and German, A. W. 1998. *America and the Sea: A Maritime History*. Mystic, CT: Mystic Seaport Press.
- Livermore, Samuel. 1877. *A History of Block Island from its Discovery, in 1514 to the Present Time, 1876*. Hartford, CT: Case, Lockwood & Brainard.
- Marx, Deborah and Mathew Lawrence. 2006. "Nomination of Frank A. Palmer and Louise B. Crary – Shipwreck Remains to the National Register of Historic Places."
- McClelland, L.F., J.T. Keller, G.P. Keller, and R.Z. Melnick, 1990. *How to Identify, Evaluate, and Register Rural Historic Landscapes, National Register Bulletin 30*. National Park Service.
- McLoughlin, William G. 1986. *Rhode Island, A History*. New York, NY: W. W. Norton & Co.
- Mendum, Samuel W. 1897. *New England Magazine*. Vol. 16: 738–751
- Monthly Summary of Commerce and Finance of the United States for the Fiscal Year 1903*. 57th Cong. 2nd Sess. H. Doc. 15 parts 7, 8 & 9.
- National Park Service. 2010. Web site, "National Historic Landmarks Program."
<http://www.nps.gov/history/nhl/QA.htm#1>

NPS Bulletin – see McClelland above.

Ocean SAMP Chapter 7. “Marine Transportation, Navigation, and Infrastructure.”

Olsen, S.; Stevenson, D. 1975. Commercial Marine Fish and Fisheries of Rhode Island. Coastal Resources Center, University of Rhode Island: Marine Technical Report 34.

Pope, Peter E. 2004. *Fish into Wine: The Newfoundland Plantation in the Seventeenth Century*. Chapel Hill, NC: University of North Carolina Press.

Rhode Island Historical Preservation and Heritage Commission (RIHPHC). 2007. *Performance Standards and Guidelines for Archaeological Survey: Standards for Archaeological Survey*” RIHPHC, Providence, RI.

Rhode Island Historical Preservation and Heritage Commission (RIHPHC). 2010. Web site, “National Register.” RIHPHC, Providence, RI. <http://www.preservation.ri.gov/register/>

Rhode Island Historical Society, 1993. *What a Difference a Bay Makes*. Providence, RI: Rhode Island Department of State Library Services.

Ritchie, Ethel Colt. 1980. *Block Island, Lore and Legends*. Block Island, RI: Francis M. Nugent.

Schroder, Walter K. *Defenses of Narragansett Bay in World War II*, 1980 repr. 1996. Chapel Hill, NC: Professional Press.

St. Martin, Kevin and Madeleine Hall-Arber. 2008. “The missing layer: Geo-technologies, communities, and implications for marine spatial planning. *Marine Policy*, 32: 779-786.

Schurr, Sam H. and Bruce C. Netschert. 1960. *Energy in the American Economy, 1850 - 1975: An Economic Study of its History and its Prospects*. Baltimore: The Johns Hopkins Press.

The Seaman’s Bill: Hearings Held Before the Committee on Merchant Marine and Fisheries on House Bill 11372, December 14, 1911. 1911. Washington: GPO.

Snow, Ralph Linwood and Douglas K. Lee. 1999. *A Small Shipyard in Maine: Percy & Small and the Great Schooners*. Bath: Maine Maritime Museum.

Snyder, Marlene and Don Snyder. 1998. *Rhode Island Adventure Diving*. Westfield: Marlene and Don Snyder.

Snyder, Marlene and Don Snyder. 1999. *Rhode Island Adventure Diving II*. Westfield: Marlene and Don Snyder.

Statutes of the United States of America passed at the First Session of the Forty-Ninth Congress, 1885-1886. 1886. Washington: Government Printing Office.

Swanson, Carl E., 1991. *Predators and Prizes: American Privateering and Imperial Warfare, 1739-1748*. Columbia, SC: University of South Carolina Press.

Tveskov, Mark. 1997. Maritime Settlement and Subsistence Along the Southern New England Coast: Evidence from Block Island, Rhode Island. *North American Archaeologist*, 18: 4, pp. 343-361.

U.S. Fish and Wildlife Service. *North Cape Oil Spill Restoration*. Available on line at <http://www.fws.gov/Contaminants/restorationplans/NorthCape/NorthCape.cfm>
Last accessed March 27, 2010.

Vickers, Daniel. 1994. *Farmers and Fishermen: Two Centuries of Work in Essex County*. Chapel Hill: University of North Carolina Press.

Wroth, Lawrence C., ed. 1970. *The Voyages of Giovanni da Verrazzano, 1524-1528*. New Haven: Yale University Press.