

ABSTRACT

Marshall B. Lamm. FLOATING FORTRESS, FLOATING CITY, FLOATING MONUMENT: A COMPARITIVE STUDY OF THREE AMERICAN WARSHIP MUSEUMS. (Under the direction of Dr. Lawrence E. Babits) Department of History, November 2011.

This thesis presents three warship museums within the United States as case studies to examine the needs and practices of a unique subset of museum organizations. A museum warship is simultaneously an exhibit, artifact, and facility, requiring significant maintenance and preservation efforts.

In order to understand these organizations, it is necessary to analyze the scope of these museums. This analysis attempts to create a comprehensive list of warship museums worldwide, and to highlight the dominant presence of American Second World War ships in the field. The case studies have been selected based on the number and types of ships preserved by these museums, and the major preservation, exhibition, curatorial, and collection challenges before these museums. This analysis combines naval history, historic preservation, and museum theory to better understand these organizations and the ships they preserve.

Battleship *North Carolina* oversees its namesake, a ship active only during the Second World War. The *North Carolina* was saved from potential scrapping in the early 1960s due to public support from the ship's namesake state. It has been a museum ship since 1962, located in Wilmington, North Carolina.

Patriots Point Naval and Maritime Museum currently maintains the aircraft carrier *Yorktown*, destroyer *Laffey*, and submarine *Clamagore*, and has previously maintained other ships since opening in 1976. All of the museum's current ships were constructed during the Second World War, but had lengthy post-war careers. The museum is the focal point of a larger commercial development project across the Cooper River from Charleston, South Carolina.

USS *Lexington* Museum On the Bay operates the second aircraft carrier so named. Named in honor of the first carrier, sunk during the Battle of the Coral Sea in 1942, it served a variety of roles until its decommissioning in 1991. The ship has been exhibited by the museum since 1992 in the City of Corpus Christi, TX, Harbor.

The study finds common practices at all three museum sites, a product of information being informally disseminated through individual communications between organizations. Each museum has demonstrated distinctive strengths and weaknesses. Battleship *North Carolina*'s curatorial practices are the strongest of the three case studies. Patriots Point has struggled to overcome years of poor selection of directors and severe preservation issues, and USS *Lexington* Museum By the Bay has developed the most comprehensive volunteer program.

FLOATING FORTRESS, FLOATING CITY, FLOATING MONUMENT. A COMPARITIVE
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Marshall B. Lamm

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TABLE OF CONTENTS

LIST OF FIGURES	vii
LIST OF PHOTOGRAPHS.....	viii
INTRODUCTION	1
CHAPTER ONE. HISTORY OF MODERN WARSHIP MUSEUMS.....	7
CHAPTER TWO. QUANTITATIVE OVERVIEW OF WARSHIP MUSUEMS.....	16
CHAPTER THREE. USS <i>NORTH CAROLINA</i>	36
CHAPTER FOUR. USS <i>YORKTOWN</i> AND PATRIOTS POINT	67
CHAPTER FIVE. USS <i>LEXINGTON</i>	114
CONCLUSION.....	140
REFERENCES CITED.....	148
APPENDIX A. MUSEUM STAFF COMMUNICATIONS	154
APPENDIX B. WARSHIP MUSEUM DATABASE	156

LIST OF FIGURES

1. Ship Classification Number System	17
2. Ship Representation by VCN.....	17
3. Special Conditions and Descriptions	19
4. Incomplete Data By Variable.....	20
5. Museum Warships By Country.....	23
6. “Museum Date” Plot	23
7. “Museum Date” Plot of Ships Within the United States	24
8. Line Graph Plot of Figure 6.....	25
9. Line Graph Plot of Figure 7	25
10. Cities With Four or More Museum Warships.....	26
11. “Country” Versus “Nationality”	28
12. The “Interregnum”	30
13. Date Differences Clustered	31
14. Tier-Country Cross Tabulation.....	32
15. Tier-VCN Cross Tabulation.....	32
16. Mean Service Date by VCN	34
17. Timeline of Museum Ships Administered by Patriots Point	84

LIST OF PHOTOGRAPHS

1. Battleship <i>North Carolina</i> 's archives	42
2. Renovated officer's wardroom and lounge.....	42
3. Print Shop exhibit	44
4. Access gangway.....	46
5. Hatch to Turret #3 left gun room	46
6. Display inside Turret #3's center gun room	47
7. Signage for main tour route.	48
8. Optional tour route signage.....	48
9. OS2U Kingfisher signage	49
10. Crew mess space, with chapel exhibit	50
11. Laundry Pressing Room exhibit.....	51
12. Laundry Room signage.	51
13. Secondary Battery Plotting Room	52
14. <i>North Carolina</i> 's bridge.....	52
15. Entryway cut through #2 Turret magazine armor.....	53
16. Access ladder added to #2 Magazine's mezzanine.....	53
17. Reverse view of access ladder	54
18. "The Immortal Showboat" promotional photograph.....	55
19. <i>North Carolina</i> 's camouflage	57
20. <i>North Carolina</i> 's restored teak deck.....	57
21. The museum's deck workshop.....	58
22. Removed hatch.....	59

23. Obstructed display with hatch cutaway	60
24. Detail of railings installed by the museum	61
25. Restored OS2U Kingfisher	65
26. Creative display in a crew shower	66
27. <i>Ingham's</i> superstructure in June 2009	82
28. <i>Laffey</i> and <i>Ingham</i> in June 2009	84
29. Bow-on view of <i>Clamagore</i> , 2009.....	85
30. Bow-on view of <i>Clamagore</i> , 2011.....	85
31. <i>Yorktown</i> and access causeway.....	86
32. Patriots Point's Marina	87
33. Civil Defense emergency lockers	88
34. <i>Yorktown's</i> art storage space.....	90
35. <i>Yorktown's</i> model storage space.....	90
36. Ladder access.....	91
37. Restored <i>Yorktown</i> ready room.....	92
38. <i>Yorktown</i> aviation crew berthing compartment	92
39. Detail of <i>Enterprise</i> exhibit	93
40. <i>Yorktown's</i> chapel space	94
41. <i>Essex</i> exhibit	94
42. Tour Route signage	95
43. Wayfinding signage	95
44. Wayfinding arrows.....	96
45. Wayfinding arrow confusion	96

46. <i>Yorktown</i> 's Petty Officer's Galley and museum cafeteria.....	97
47. Modified entrance to <i>Clamagore</i>	98
48. <i>Ingham</i> 's "outhouse"	99
49. <i>Yorktown</i> Operating Room	100
50. Amphibious Warfare exhibit.....	101
51. Detail of Amphibious Warfare exhibit	101
52. Exhibit computer terminal	102
53. Maintenance work on <i>Clamagore</i> , September 2011.....	105
54. Corrosion on <i>Clamagore</i> 's hull, June 2009	105
55. Corrosion on <i>Clamagore</i> 's hull, September 2011	106
56. <i>Yorktown</i> 's starboard catapult, June 2009	107
57. <i>Yorktown</i> 's starboard catapult, September 2011.....	107
58. Concrete patch on <i>Yorktown</i> 's flight deck.....	108
59. <i>Laffey</i> hull corrosion	109
60. <i>Laffey</i> exhibit aboard <i>Yorktown</i>	110
61. Retired older exhibit display	111
62. Early museum exhibit	112
63. Creative interpretation of <i>Yorktown</i> 's brig	113
64. Marker indicating the 5 November 1944 kamikaze strike.....	118
65. <i>Lexington</i> 's list.....	121
66. <i>Lexington</i> and access causeway	122
67. Ship's Store and Aircraft Restoration Area	123
68. USS <i>Lexington</i> Museum on the Bay's archives.....	124

69. USS <i>Lexington</i> Museum on the Bay’s library	125
70. Tour orientation board indicating tour route color-coding	126
71. Exterior signage	126
72. Interior signage	127
73. A-4 Skyhawk undergoing restoration	127
74. Computer game kiosks on hangar deck	128
75. 5” turret recovered from <i>Des Moines</i>	128
76. Fully labeled interior of 5” turret.....	129
77. Fully labeled interior of 5” turret.....	129
78. Large diorama of Pearl Harbor attack.....	130
79. Partial re-creation of “Pearl Harbor” movie set.....	131
80. Propeller recovered from <i>Cabot</i>	132
81. Cactus found growing on <i>Cabot</i> ’s flight deck.....	132
82. Model Room undergoing reorganization.....	133
83. Damage control exhibit.....	134
84. Portion of asphalt compound test section	137
85. Museum staff removing rubber coating from the flight deck	137
86. <i>Yorktown</i> ’s cookie recipe.....	144

INTRODUCTION

The use of monuments and memorials to preserve and interpret military conflicts is a long-standing practice (Rabe 2011). An academic perspective has provided a wealthy body of supporting research and literature – unfortunately, this body is almost entirely concerned with the terrestrial aspects of preservation and museum activity. Military historians and archaeologists have established methods of extracting information or interpreting terrestrial battlefields using sites, structures, and the landscape. Public consumers of military history can tour Wilmer McLean’s home in Appomattox Court House or Chalmette Battlefield. Even battlefields with limited preserved landscapes, such as Breed’s Hill/Bunker Hill, can be utilized by historians and the public.

Naval history offers significant challenges to interpretation and exhibition. Publicly accessible elements of material cultural elements of naval conflict are more limited. Landmarks are rare and underwater remains require a significant investment in equipment and infrastructure to examine. Even naval battle sites close to shore, such as the Battle of Hampton Roads or the site of *H.L. Hunley*’s attack on USS *Housatonic* off Charleston Harbor, provide limited capacity for interpretation. The practice of preserving warships is a useful method for interpreting naval warfare as well as the unique nature of life on board warships. Warship museums inhabit a distinct historical niche combining weapons platform, floating city, artifact, exhibit spaces, and often museum facilities. An aircraft carrier’s flight deck, a battleship’s turrets, or the confined spaces of a submarine are as important to creating a better understanding of military history as are Little Round Top’s slope or Fort McHenry’s parapets.

This capability is especially true of post-Industrial-Revolution warships. With the transition from wood and sail to iron, steel, and steam, warships developed into complex

structures requiring an increasingly sophisticated physical and organizational infrastructure contained within the ship. Steel construction also allows visitor access to internal spaces without concern about deterioration. Though HMS *Victory* in Portsmouth, England, and USS *Constitution* in Boston, Massachusetts, are open for interior touring, their wooden structure is still susceptible to deterioration, and they will require periodic major restoration (UK Ministry of Defence 2009). *Mary Rose*, also berthed in Portsmouth, England, and *Vasa* in Stockholm, Sweden, are examples of preserved warships contained within museum facilities. The fragile nature of these wooden hulls limits public access to the deck and interior spaces. A visitor to *Vasa* can see the ship, but only as a large artifact exhibited inside a terrestrial museum setting. *North Carolina's* engine room, *Lexington's* flight deck, and *Clamagore's* torpedo room offer visitors an immersive interpretation.

The phrase “warship museum” is used in this study with a specific meaning. Each term possesses its own criteria. “Warship,” for the purpose of this research, entails any ship or small craft designed to fulfill a combat function. A Coast Guard cutter (USCGC *Ingham*) or purpose-built wartime transport (SS *Jeremiah O'Brien*) satisfies this definition; a tug built by the U.S. Army (USAT *LT-5*) does not. The term’s use in this study also includes small watercraft such as torpedo boats and landing craft. They do not fit traditional definitions of ships or warships, but they are preserved by museums because they served in combat. The second word, “museum”, requires the ship be available for public display – even if it is regularly taken off display for preservation or operation – and operated by an organization dedicated to exhibiting and interpreting the vessel. The United States Coast Guard is not a traditional museum organization, but it operates historic the sail training bark *Eagle*. The Coast Guard maintains and preserves the

ship, and exhibits it both during tall ship displays and at its home port of New London, Connecticut (HNSA 2008: 40).

Though numerous warship museums operate worldwide, there is a scarcity of supporting literature and research to assist historians or the museums. A number of related published works exist, but these invariably fall into one of two categories. The first category consists largely of directories – laundry lists with brief historical descriptions and basic museum information. These works are primarily travel guides and adequate for consumers of popular history, but offer little to historians. The second category is ship-specific histories. Two distinct varieties of this type of publication exist. These are histories written by academics or memoirs and historical accounts written by former crew members.

These two categories offer a mosaic of useable information, but there are no textbooks or reference manuals specifically dedicated to warship museum operation, as there are for terrestrial historic sites or structures. There is no absence of professional material, however. Ship museums regularly communicate with each other and share information. The Historic Naval Ships Association (HNSA) is an American-based professional association supporting the preservation of historic vessels worldwide. HNSA has undertaken a commendable effort in offering support to member organizations, but many warship museums suffer from problematic issues.

Operating and maintaining a warship museum is a tremendous undertaking. The majority of American warship museums utilize vessels loaned from the U.S. Navy or the U.S. Maritime Administration, using similar donation processes. The Navy's Sea Systems Command has operated the Ship Donation Program and Ship Donation Inspection Program as part of the Navy Inactive Ships Program since 1948. The Ship Donation Program administers vessels

intended for donation to state or non-profit organizations on behalf of the Secretary of the Navy (10 USC 7306). Potential museum warships are evaluated and placed on “hold status” by the Inactive Ships Program, while the Ship Donation Program is the contact agency for potential warship museum organizations.

The Ship Donation Program is responsible for communicating with organizations seeking to receive an inactive warship donation, including determining the organization’s viability and qualifications. It also administers the evaluation process. Any organization seeking a warship donation must present the Navy with a satisfactory plan, including vessel relocation, operation, and maintenance. This process has evolved since the Program’s establishment; the most recent procedural modifications occurred in June 2009 (US Navy 2009b). The Ship Donation Program uses a tiered application system to evaluate potential organizations, with each successive tier involving greater and more concrete details. Numerous Cold-War-era ships are currently on hold for the Ship Donation Program, and applications are in various stages of completion. If no suitable application is received, the Inactive Ships Program may reclassify the potential museum warship and mark it for some form of disposal (US Navy 2009a). After an organization receives its donation, The Ship Donation Inspection Program conducts periodic inspections to ensure donated ships (47 as of 2009) meet Program maintenance and appearance standards (US Navy 2009a). For most vessels, the Program makes annual or semi-annual inspections (Roger Miller 2007; David Clark 2009; “Rusty” Reustle 2010; pers. comm.). The Inspection Program’s interactions with case study museums varies, and are discussed at greater length in the respective sections.

The practice of preserving and memorializing museum warships has developed rapidly since the end of the Second World War. The process is complex, and as the case studies

will demonstrate, warship museums can experience a wide variety of preservation issues. The scarcity of information is a hindrance not only to existing warship museums but to organizations seeking to establish new ones. While this process occurs throughout the world, this research is concerned with American warship museums. Some information and research is applicable to any museum ship regardless of location or military or civilian history, but American vessels dominate the field, as illustrated by the subsequent sections regarding the history of warship preservation, museum activity, and the quantitative analysis attempting to establish a comprehensive dataset.

This study seeks to examine what makes the practice of warship preservation and exhibition so distinctive, the similarities and differences that exist between different warship museum organizations, and the organizations' individual strengths and weaknesses. It is not necessary to study these sections at length to understand that the majority of warship museums exist because of American industrial output during the Second World War. Modern warship preservation would not exist without the cultural phenomenon of American interest in preserving Second World War material culture. It is not the only conflict represented, however; museum vessels also memorialize the Revolutionary War (*Philadelphia*, Washington, D.C.), the War of 1812 (USS *Constitution*, Boston, Massachusetts), the American Civil War (CSS *Jackson*, Columbus, Georgia), the Spanish-American War (USS *Olympia*, Philadelphia, Pennsylvania), the First World War (USS *Texas*, LaPorte, Texas), the Korean War (USS *Joseph P. Kennedy*, Fall River, Massachusetts), and the Vietnam War (USS *Turner Joy*, Bremerton, Washington).

The extent of American predominance is not precisely measurable, however. Despite the presence of HNSA and Britain's Advisory Committee on National Historic Ships (AC-NHS), there is no comprehensive list of museum warships, American or otherwise. To properly

understand and analyze warship museums, such a list is essential. In addition to geographical asymmetry, the warship museums field is heavily weighted toward ships from the Second World War era. The vessels currently maintained by all three sites were commissioned between 1941-1945, though the museums present noteworthy differences. The most significant differences exist with numbers and types of ships, the museum organization's age and history, the museum's public or private administration, and the individual ships' service lives.

CHAPTER ONE HISTORY OF MODERN WARSHIP MUSEUMS

The preservation and public display of naval vessels is a long-standing cultural tradition. Terrestrial monuments to naval victories were common in ancient Greek and Roman cities (Rabe 2011). The victorious government crafted trophy displays featuring captured enemy *rostrae* (rams), the primary metal component and the ship's principal weapon (Casson 1991:136). Following the defeat of the Spanish Armada in 1588, Elizabeth I's government used St. Paul's Cathedral to publicly display a number of "trophies" from their naval victory in the English Channel. The records are not entirely clear as to what the trophies were, but it included captured ensigns (Martin 1999:237).

The modern incarnation of warship preservation emerged almost simultaneously with terrestrial historic preservation. The earliest examples of American historic preservation efforts began in the 1850's. The Mount Vernon Ladies' Association of the Union's efforts to acquire George Washington's home succeeded in 1856 (Wilstach 1916:257-259). Washington's Revolutionary War headquarters in Newburgh, New York became the first state-administered historic site in the U.S. in 1850 (Barrett 1999:7, 15). The first modern warship preservation effort occurred in 1830, when a Navy inspection determined that the aging USS *Constitution* had experienced deterioration.

The traditional narrative held that an article appeared in the 14 September 1830 *Boston Advertiser* announcing the Navy's intention to scrap the vessel. This announcement prompted Oliver Wendell Holmes, Sr. to write the famous poem "Old Ironsides." Public response to the poem forced Congress to authorize the ship's repair, which began in 1833 (Hollis 1900:220). Some historians have been skeptical of this story; Tyrone Martin made a compelling case that the *Advertiser* misreported Navy policy, and the *Constitution* was not slated for immediate disposal

(Martin 2003:234). Despite this debate, the *Constitution's* 1830's refit was the result of public demand to preserve a historic warship.

Constitution underwent two more major restorations prior to the Second World War. The second restorative refit was planned to have the vessel ready for the 1876 Centennial Exposition, but work was not completed until 1877 (Hollis 1900:237). By 1900, the ship's condition dictated another major overhaul, but Congress left funding to private sources (Martin 2003:339). Limited funding was later secured, but the vessel did not receive sufficient repairs until the 1920's. Congressional support helped raise sufficient private funding, and work was finished in 1930 (HNSA 2008:6). This restoration marked the first concession to modern necessities; the vessel's internal structure was modified to accommodate modern plumbing and electrical lighting (Martin 2003:347-348).

The efforts to preserve *Constitution* typified warship preservation during the interwar period. Government entities acceded to public demand, but sought private means to fund preservation efforts. Similar efforts by the British government resulted in the restoration of HMS *Victory* in 1922 (Jones 1993: 132). The Washington Naval Treaty of 1921 limited naval expenditures in the wake of the First World War. Many older battleships were marked for disposal as part of the international agreement. The Japanese battleship *Mikasa*, was granted an exemption at Emperor Hirohito's request. *Mikasa* served as Admiral Togo Heihachiro's flagship in 1905 in his victorious clash with the Russians at Tsushima, and the Japanese turned it into a museum in 1926 (Conway 1985:224).

The gunboat *Philadelphia* is the counter-example of warship preservation during this period. It sank and settled upright on the bottom of Lake Champlain during the 1776 Battle of Valcour Island. Lorenzo Hagglund found the gunboat in a well-preserved condition during a

summer 1935 salvaging expedition (Bratten 2002:74). Hagglund intended to donate the vessel to an organization willing to provide a museum facility, and considered both the Smithsonian and the University of Vermont. Unfortunately, no organization could arrange funding for a preservation facility; the vessel became a mobile tourist attraction (Bratten 2002:84). Eventually, the vessel's deterioration became acute, and the Smithsonian eventually acquired the vessel in 1960. Unlike *Constitution*, *Victory*, or *Mikasa*, *Philadelphia* sank intact and was preserved, not by military maintenance, but by cold and dark lake water. It was discovered, raised, and maintained by a private individual until the Smithsonian agreed to acquire it after World War II. These early preservation efforts represented the first stage of a combined pattern of memorialization and monumentation similar to terrestrial historical preservation movements following the American Civil War. The first preservation efforts were conducted by decentralized non-profit organizations enlisting small donations from community members (Martinez 2000:144-149).

Limited warship preservation and museum activity continued through the 1930s despite global economic depression. The escalation of regional conflicts into global war beginning in 1939 completely curtailed museum warship activity. In one unfortunate case, America's entry into the war resulted in the loss of a valuable warship museum. The battleship *Oregon*, instrumental in the Spanish-American War victory off Santiago, Cuba, had been preserved in Portland at the state's request. It was demilitarized, engines were disassembled, and the propeller shaft removed (Sternlicht 1977:113-114). The Battleship *Oregon* Commission operated it as a floating museum, expending the effort to build a public park connected to the vessel. *Oregon* became a victim to political decisions crafted out of haste and post-Pearl Harbor patriotic zeal. It was returned to the Navy (even early Navy museum ships utilized a loan

system), despite a lack of any practical value. The U.S. War Production Board decided *Oregon's* steel was more valuable as scrap. It was stripped and gutted, and served out the war as a barge. The hull was finally broken up in 1956 (Sternlicht 1977:115, 120). The ship's mast was saved and erected as part of a Portland waterfront park in 1956.

Oregon's donation to the war effort was worthless; the U.S. Navy rapidly built an unprecedented wartime navy. American industry undertook a mobilization effort that mass-produced thousands of vessels, ranging in size and purpose from massive aircraft carriers to small landing craft. Technological advancements resulting from wartime experience rendered some ships and ship types obsolete or superfluous even before their completion. Following the Japanese surrender in September 1945, the American military possessed an excess of military equipment. The Navy faced a unique challenge in demobilization. Throughout history, excess naval vessels were stored "in ordinary" for potential future use. The unprecedented numbers of excess vessels, including numerous aircraft carriers, battleships, and cruisers, required significant planning.

The Navy did not intend to save all its wartime vessels. Most pre-war ships were inadequate for the Navy's future needs. The *Essex*-class aircraft carriers eliminated any need for the *Saratoga* and *Enterprise*. The battleship's future utility to the Navy was debated, but First-World-War-era dreadnoughts such as *Nevada* and *Texas* were clearly unnecessary. Many older ships were relegated to target practice or other disposable duties. The most significant research using these naval vessels was Operation Crossroads, the July 1946 atomic weapons testing at Bikini Atoll. The two detonations, tests Able and Baker, destroyed or irreparably damaged several distinguished vessels. The battleship *Nevada*, a Pearl Harbor survivor and Normandy invasion veteran, was the target of the air-dropped atomic bomb for test Able. It survived both

Able and the underwater-detonated Baker explosion. *Nevada* was eventually sunk during target practice in July 1948. The aircraft carrier *Saratoga*, one of two American carriers to survive the first year of the Pacific campaign, was sunk by the Baker blast.

Many vessels constructed during the war were valuable enough to preserve for a potential future naval conflict. The Navy established Reserve Fleets prior to the First World War. The post-Second World War Reserve Fleets were expanded to accommodate the unprecedented numbers of vessels placed into “mothballs.” The most significant reserve fleets were located at Bayonne, New Jersey, and Bremerton, Washington. The continuing evolution of naval warfare and ship construction resulted in a declining need for other Reserve Fleet vessels. Throughout the late twentieth century, the Navy culled Reserve Fleet ships. Some were donated to other navies. Numerous vessels donated to American allies became museum ships with their donor countries. The *Fletcher*-class destroyer *Charette* (DD-581) was sold to the Royal Hellenic Navy in 1959. Renamed *Velos*, the destroyer eventually became a museum ship in 1994. Most Reserve Fleet ships were scrapped, but some were saved due to increasing public demand for warship preservation.

The next chapter highlights the clusters of increased activity in greater detail, but three principal periods of increased warship memorialization and warship museum proliferation are worth noting. Immediately following the Second World War, preservation practices emergent in the interwar years began to reappear. The initial post-war period (1946-1959) saw limited activity. The battleship *Texas* was the first major vessel preserved after the war. It was donated to the Battleship *Texas* Commission in 1948 (HNSA 2008:80). The Navy donated the captured German U-boat *U-505* to the Chicago Museum of Science and Industry in 1954, and finally brought a long-term plan to fruition for the cruiser *Olympia*, Commodore George Dewey’s

flagship at the Battle of Manila Bay. *Olympia* was initially retained in 1922 for future preservation efforts. Economic depression and global warfare precluded museum efforts for many years. The Spanish-American War relic was finally donated to a museum organization in 1957 (HNSA 2008:80, 106). Not every preservation effort was successful. The famed aircraft carrier USS *Enterprise* was the subject of multiple preservation plans, but none succeeded and the “Big E” was sold for scrap in 1956.

As *Enterprise* was scrapped, the Navy determined to further reduce the Reserve Fleets. By the late 1950s, it was clear to the American political and military leadership that battleships were too obsolete to warrant their continued retention. As a result, six of ten “fast battleships” were slated for disposal – the two *North Carolina*-class and four *South Dakota*-class battleships. This downsizing sparked the first major warship preservation effort among the American public. Prominent government and private individuals spurred mass movements among the citizens of North Carolina, Alabama, and Massachusetts. All three states mobilized fundraising efforts to save their namesake battleships. The *North Carolina* and *Massachusetts* preservation efforts included massive coin collection drives among the states’ school children. These three battleships – *North Carolina*, *Alabama*, and *Massachusetts* – were all donated to private, non-profit museum organizations between 1961 and 1965. The three warship museums played a significant role in creating HNSA to guide and advise existing and future warship museum organizations (HNSA 2008:6). In addition to U.S. Navy warship donations, the U.S. Maritime Administration donated wartime merchant vessels to museum organizations. The first American Second World War merchant ship to become a museum, the Liberty Ship *Jeremiah O’Brien*, opened to the public in 1979 (HNSA 2008:53). The increased activity in warship preservation, coupled with the American Civil War centennial memorial efforts, resulted in several

Confederate warships being recovered during the early 1960s. These older vessels were often subjected to inferior preservation treatment and were often looted. The ironclad USS *Cairo* was severely damaged during its excavation. Shaped-charge explosives were used to dislodge projectiles embedded in cannon barrels, and cracked a 32-pounder (Bearss 1980:122-123). The vessel's hull was lifted from the Mississippi River using cables secured to barges, which severed the *Cairo* into three sections (Bearss 1980:145-147). The ram CSS *Neuse* was heavily damaged both by recovery efforts and salvagers (Campbell 2009:61).

The continued evolution of naval warfare and technology prompted the Navy to discard more Second-World-War-era vessels during the 1970s. Between 1969-1982, the Navy saw its highest levels of museum ship donation. These vessels were predominantly of three types, aircraft carriers, destroyers, and submarines. The *Essex*-class aircraft carriers became obsolete during the Vietnam War, and many were relegated to training, helicopter, and anti-submarine roles. Carriers such as *Yorktown* could not accommodate larger and heavier aircraft. Nuclear power and propulsion became standard on aircraft carriers and submarines. The Navy decommissioned numerous older diesel submarines and donated 14 to museum organizations between 1969 and 1976.

The third period of increased warship museum activity, between 1988 and 1994, resulted from two factors. The Warsaw Pact's breakup and Soviet Union's collapse ended the Cold War and eliminated the need for a larger Navy, which reduced the numbers of its active and reserve vessels. This period also coincided with the Second World War fiftieth anniversary commemorations, resulting in increased attention and demands for memorialization and monumentation efforts. The Navy's cutbacks allowed museum organizations access to a diverse assortment of warship types. Museum donations included aircraft carriers, cruisers, destroyers,

and several types of auxiliary smaller craft. This period included several unique vessels. The aircraft carrier *Lexington*, the last *Essex*-class vessel in service, was donated to a Corpus Christi, Texas-based museum in 1992. The cruiser *Salem*, the only remaining unmodified Second World War cruiser, went to a Quincy, Massachusetts museum in 1994.

After a brief lull, demand for museum warships increased again between 1997 and 2008. This fourth period of increased activity was noteworthy for the significant numbers of warships commissioned after 1945 with the full benefit of post-war technology. Cold-War-era vessels were converted into warship museums as early as 1979, when the patrol boat PTF 17 was donated to the Buffalo and Erie County Naval and Military Park (HNSA 2008:92). The Navy itself began operating *Nautilus*, the world's first nuclear-powered submarine, as a museum in 1986 (HNSA 2008:75). Public access is limited to forward portions of *Nautilus*; the aft sections containing the nuclear power plant are closed. Second-World-War-era vessels were still being preserved. The final *Essex*-class carrier to be preserved, *Hornet*, opened in 1998.

The transition from preserving the last Second-World-War-era to Cold-War-era vessels is well defined by five warships. The aircraft carrier *Midway* and the four *Iowa*-class battleships were designed during wartime, but received multiple modernizations and actively served though the 1990-91 Gulf War. *Midway* opened as a museum in San Diego, California, in 2004 (HNSA 2008:71). The four *Iowa*-class battleships were political footballs throughout the Cold War and for several years after the Soviet Union's dissolution. Congressional and military leadership was deeply divided on the four battleships' usefulness in the modern navy (*Washington Post* 2005). The ships were finally stricken from the Naval Vessel Register in 1995. Congressional defense authorization acts attempted to prevent the permanent loss of *Iowa* and *Wisconsin* as naval assets; as recently as 2006 the Department of the Navy and Congress were still conducting

political maneuvering regarding the vessels. *Missouri* was the first to be preserved; the ship that hosted the Japanese surrender became a permanent museum in Pearl Harbor in 1998-99 (HNSA 2008:72). *New Jersey* opened in 2001 (HNSA 2008:77). *Wisconsin* was moved to Norfolk in 2001 and berthed adjacent to the Nauticus Museum. Nauticus houses the Hampton Roads Naval Museum, the organization tasked with maintaining “Wiskey.” The Navy officially donated *Wisconsin* to the Hampton Roads Naval Museum in 2009, effectively ending the political debate and allowing greater tour access to interior spaces (*Norfolk Virginian-Pilot* 2010).

Only one battleship remains unpreserved – the *Iowa* rests in the Suisun Bay, California, National Defense Reserve Fleet (U.S. Navy 2009c). The battleship is the final Second World War vessel in the Ship Donation Program or Inactive Ship Program inventory (U.S. Navy 2009c). The Navy sought a potential museum organization in nearby San Francisco, but the city opposed a plan for political reasons (*USA Today* 2006). In 2010, the Los Angeles-based Pacific Battleship Center submitted an application for *Iowa*. The Navy accepted the application in September 2011, with a museum location planned for San Pedro (*Los Angeles Times* 2011).

CHAPTER TWO QUANTITATIVE ANALYSIS OF WARSHIP MUSEUMS

The creation of an all-encompassing warship museum database begins with the closest existing approximations. The Historic Naval Ships Association (HNSA) and the National Historical Ships (NHS) provided partial lists of vessels within the scope of their respective objectives. HNSA is a global organization, representing 175 ships in 2010. HNSA's members are principally drawn from former U.S. Navy vessels or located within the U.S., though member organizations exist in 11 other countries. National Historic Ships is a British organization under the Department of Culture, Media, and Sport, exclusively concerning the 215 Historic Fleet registry vessels. Both organizations work with non-military vessels, but large portions of each registry allow for an excellent starting point for this database. An investigation was conducted to locate as many warship museums as possible. This search included the World Ship Trust's *The International Register of Historic Ships* (Brouwer 1998). This publication lists all known ships and boats of a historical nature, regardless of warship or museum qualification. The principal drawback to this publication is its age; the last edition was published in 1998. Further assistance was solicited from numerous maritime and naval museums around the world. They provided assistance in several occasions.

With these entries assembled, the database consists of 255 vessels that satisfy the "warship museum" criteria. The database is reproduced in full in Appendix A. The vessels have been identified and quantified, with variables grouped into five basic categories – identification, location, classification, operation, and chronology. The basic identification variables include the vessel's name and nation of origin. Location variables identify the vessel's current, or most recent, museum city and country location – including state or province for vessels located in the United States, Canada, or Australia. The remaining three variables require explanation. To

quantify vessel types for ease of data collation and analysis, this database will create a Vessel Classification Number (VCN). The vessel's type is organized with respect to purpose and size, and is heavily influenced by HNSA's organization of vessels (HNSA 2008: 10-11). Figure 1 offers descriptions of each VCN; Figure 2 presents aggregate vessel representation by VCN.

Figure 1: Vessel Classification Number System

VCN	Type	Description
1	Aircraft Carrier	Fleet, light, escort, helicopter, and amphibious warfare carriers
2	Battleship	Capital Ships from pre- and post-dreadnought eras
3	Cruiser	Heavy, light, battle, armored, protected, and missile cruisers
4	Destroyer	Includes American destroyer escorts
5	Escort Vessels	Corvettes, cutters, frigates, gunboats, nineteenth-century ironclads, mine warfare vessels, missile boats, monitors, patrol boats, and submarine chasers
6	Light Craft	Hovercraft, landing craft, manned torpedoes, suicide craft, and torpedo boats
7	Submarines	Includes midget submarines
8	Sailing	Vessels with wooden frames utilizing sails for propulsion
9	Sailing/Dual Propulsion	Vessels with wooden, iron, or steel frames utilizing both sail and engine power for propulsion
10	Auxiliaries	Transports, military research vessels, and other armed military support craft

Figure 2: Ship Representation by VCN

VCN	Frequency	Percent
1	5	2.0
2	10	3.9
3	8	3.1
4	21	8.2
5	51	20.0
6	55	21.6
7	81	31.8
8	12	4.7
9	1	0.4
10	11	4.3
Total	255	100.0

VCN categories 5 and 6 were carefully constructed to minimize overlap in either size or purpose. The Escort Vessel classification represents ships smaller than a destroyer, but large enough to operate independently. The Light Craft classification includes vessels designed for inshore or short-range work, and those that cannot be considered “ships,” such as landing craft and small suicide boats.

Operational variables define the ship’s preservation and exhibition status. The variables recorded are described in Figure 3. The unique conditions of several specific ships require discussion before presenting and analyzing the database. “Operational” refers to the ship’s ability to operate under its own power. This condition does not necessarily entail increased preservation and maintenance efforts. The U.S. Navy (and many other navies) requires a ship to be inoperable under its own power as a prerequisite to museum donation; this criterion is discussed at length during the case studies. “Dry” and “Indoors” are conditions delineating protection from the elements. Removal from continual contact with water significantly decreases maintenance requirements, while placing a vessel in a climate-controlled facility further reduces maintenance requirements.

Several vessels present unique condition combinations. Portions of USS *Monitor*, including the turret, have been removed from the wreck site, conserved and exhibited, though the hull remains at the wreck site (HNSA 2008: 74). Because of the widespread retrieval of components, *Monitor* is considered “Raised,” “Wreck,” and “Disassembled” for this study. Some vessels are classified as “Raised” without being classified as a “Wreck.” Vessels such as *Holland Boat #1* were abandoned in water, but were largely intact when extracted for museum usage (HNSA 2008:48). The Italian cruiser *Puglia* represents the oddity of “Disassembled” vessels. Decommissioned after the First World War, *Puglia* was memorialized by the Italian

Fascist Government at eccentric writer Gabriele d’Annunzio’s request. The cruiser was disassembled, then the hull and superstructure were reassembled as part of d’Annunzio’s estate gardens (Licht 1982:318, 321). *Mary Rose* is not considered “Dry,” despite being “Indoors”. Portions of it remain in conservation tanks, while the largest surviving section was constantly sprayed with polyethylene glycol (PEG) to preserve the wood (Marsden 2009:xxii-xxiii). The spraying phase concluded in 2010, and the drying process will continue through 2015 (Jones 2003).

Figure 3: Special Conditions and Descriptions

Operational	The vessel can operate under its own power, even if other functions have been disabled.
Dry	The vessel’s hull is not in constant contact with a body of water.
Indoors	The vessel is housed within a climate-controlled facility or protected from weather elements.
Wreck	The vessel is not fully intact, or remains sunken.
Raised	The vessel was removed from its wreck site for preservation or display.
Disassembled	The vessel has been intentionally disassembled (and possibly partially re-assembled).
Closed	The responsible museum organization has ceased public exhibition of the vessel.
Destruction	The vessel is scheduled for scrapping or some form of destruction.

The final category consists of three chronological variables – “Service Date,” “Decommissioning Date,” and “Museum Date.” The “Service Date” records the year the ship entered operational military use. The “Decommissioning Date” signifies the final year it was used for military purposes. Several older ships – particularly vessels from the nineteenth century – were used for significant periods as stationary, floating buildings. These remained military ships and received continual maintenance to ensure they did not sink, so the “Decommissioning Date” is adjusted to the date the vessel was finally removed from military service. The “Museum Date” is the year the ship was first utilized in some form of public display, exhibition, or brought under museum care and preservation. In certain cases ships were not

decommissioned, or still operated as active vessels, before and after exhibition and display. HMS *Victory* operated continually until preservation efforts began in 1922 (Jones 1993: 132). USCGC *Eagle*, formerly the German sailing ship *Horst Wessel*, entered active U.S. Coast Guard service in 1946, and has been in active service since. The ship is publicly exhibited while in port, but the Coast Guard has performed the functions of display, exhibition, and maintenance since assuming ownership (HNSA 2008: 40). *Constitution* has a decommissioning date; it was inactive from 1884 until restoration efforts began in 1897 (Jones 1993: 175).

Despite intensive efforts to locate or acquire information regarding all 255 ships, some information remains incomplete. Only chronological variables lack complete entries; Figure 4 illustrates the frequencies of missing data, both aggregate and by VCN. An entry of “0” in the database indicates the relevant date is missing; an entry of “1” indicates the entry is inapplicable. The only inapplicable entries are HMS *Victory*’s “Decommission Date” and USCGC *Eagle*’s “Decommission Date” and “Museum Date,” as described above. The relatively high percentage of missing data is not surprising; 27 of the 45 missing “Museum Date” entries concern warship museums outside the United States. Most museums with incomplete entries failed to respond to information requests. It is likely that future research would improve this database. Separating the incomplete entries by VCN highlights the significant gaps in small craft data.

Figure 4: Incomplete Data by Variable (“0” Entries only)

Variable	No.	Pct.	VCN 5	VCN 6	VCN 7
Service Date	15	5.9	1	10	4
Decommission Date	26	10.2	5	17	4
Museum Date	45	17.6	6	25	14

Despite missing chronological entries, the database still provides significant insight regarding trends in warship museums. The first objective of this database is to locate significant periods of increased preservation and museum warship acquisition activity. Figure 5 illustrates

the global breakdown of museums by nation. It demonstrates the United States' contribution to the warship museums field; 111 of the 255 museum warships (43.5%) are preserved within the United States. While other individual nations display preservation activity, such as the United Kingdom, Sweden, Germany, and the Netherlands, the numerical disparity is not simply a function of greater U.S. naval construction throughout the twentieth century. A higher level of interest in warship preservation seems to exist within the United States. Figure 6 plots the "Museum Date" variable, illustrating increases in museum activity. Figure 7 isolates museums located within the United States, including captured, donated, or purchased foreign ships. Figures 8 and 9 convert Figures 6 and 7 data, respectively, into linear graphs. The two latter figures show the pattern of four significant periods of American warship museum activity and preservation following the Second World War.

The first period of increased activity – defined by efforts to preserve battleships slated for scrapping – occurs between 1961 and 1965. Prior to 1961, 11 warships were preserved for public purposes. This number includes three captured Axis submarines, two irreparable wrecks, and three sailing vessels. Only two modern vessels, *Texas* and *Mohawk*, were secured entirely for museum purposes. This period overlapped the American Civil War centennial when, in addition to three preserved battleships, three Civil War ironclads were recovered and exhibited. The second period of activity is lengthy, and can be defined as widely as 1969-1986. It represents continued Navy efforts to cull outdated and cost-prohibitive warships during the 1970's. A tighter definition includes 1971-1982; except for 1978 and 1980, several vessels were donated to museums every year during this period. Submarines comprised the majority of these vessels (16 of 31). The other significant vessel cluster includes destroyers (6).

The third period of activity, 1988-94, resulted from two overlapping historical events. The seven-year window included the Soviet Union's breakup and the end of the Cold War. It also saw fiftieth anniversary commemorations of the Second World War and heightened interest in memorializing veterans. These overlapping events produced a widely varied array. The naval preservation efforts included Second World War warships not decommissioned until the 1990's, including the aircraft carrier *Lexington* and the battleship *Missouri*. This period also saw an increase in wartime merchant vessel preservation; prior to the 1988 Maritime Administrations donations of *John W. Brown* and *Lane Victory*, only *Jeremiah O'Brien* had been donated to a museum.

The fourth period of activity began in 1997. It effectively ended in 2008 due to the global economic recession. This period included the final Second-World-War-era donations, including *Hornet*, *New Jersey*, and *Wisconsin*. This period can be characterized by higher numbers of smaller ship types; 12 of 26 museum warships from this period are VCN 5 or 6. The period also involved the first influx of foreign warships since the Second World War. Between 1995-2005, museum organizations acquired and began exhibiting four former Warsaw Pact destroyers and submarines (three Russian and one East German vessel). Worldwide, the post-Warsaw Pact era saw a flood of Russian and East German warships; since 1989, 13 vessels have been preserved by museum organizations (Russian submarine *U-111/B-80*'s Museum Date is unknown, but it was decommissioned in 1990). Nine former Soviet submarines are now museum warships, and seven are located outside Russia. It is unclear how the Russians donate or sell warships to museums, further research specifically examining Russian and Warsaw Pact warships in foreign locations presents great potential.

Figure 5: Museum Warships by Country

Country	Freq.	Pct.
Argentina	2	0.8
Australia	7	2.7
Belgium	2	0.8
Brazil	2	0.8
Bulgaria	1	0.4
Canada	4	1.6
Chile	1	0.4
China	2	0.8
Columbia	1	0.4
Croatia	1	0.4
Denmark	4	1.6
Estonia	1	0.4
Finland	3	1.2
France	5	2.0
Germany	14	5.5
Greece	2	0.8
Hungary	1	0.4
Israel	4	1.6
Italy	6	2.4
Japan	2	0.8
Malaysia	1	0.4
Netherlands	10	3.9
North Korea	1	0.4
Norway	6	2.4
Pakistan	3	1.2
Peru	2	0.8
Poland	1	0.4
Russia	6	2.4
South Africa	1	0.4
Spain	2	0.8
Sweden	16	6.3
Thailand	1	0.4
Turkey	4	1.6
Ukraine	2	0.8
United Kingdom	23	9.0
United States	111	43.5
Total	255	100.

Figure 6: "Museum Date" Plot

	Frequency	Percent	Valid Pct.
1897	1	0.4	0.5
1921	1	0.4	0.5
1922	0	0.0	0.0
1925	2	0.8	1.0
1932	1	0.4	0.5
1935	1	0.4	0.5
1936	1	0.4	0.5
1941	2	0.8	1.0
1942	1	0.4	0.5
1943	1	0.4	0.5
1948	2	0.8	1.0
1952	1	0.4	0.5
1954	1	0.4	0.5
1955	1	0.4	0.5
1956	1	0.4	0.5
1957	2	0.8	1.0
1958	1	0.4	0.5
1959	1	0.4	0.5
1961	2	0.8	1.0
1963	2	0.8	1.0
1964	3	1.2	1.4
1965	4	1.6	1.9
1967	1	0.4	0.5
1968	2	0.8	1.0
1969	1	0.4	0.5
1970	1	0.4	0.5
1971	5	2.0	2.4
1972	4	1.6	1.9
1973	6	2.4	2.9
1974	5	2.0	2.4
1975	5	2.0	2.4
1976	3	1.2	1.4
1977	4	1.6	1.9
1978	3	1.2	1.4
1979	4	1.6	1.9
1980	4	1.6	1.9
1981	5	2.0	2.4
1982	6	2.4	2.9
1983	1	0.4	0.5
1984	5	2.0	2.4
1985	2	0.8	1.0
1986	2	0.8	1.0
1987	3	1.2	1.4
1988	7	2.7	3.4
1989	4	1.6	1.9
1990	3	1.2	1.4
1991	3	1.2	1.4
1992	6	2.4	2.9
1993	4	1.6	1.9
1994	9	3.5	4.3
1995	2	0.8	1.0
1996	5	2.0	2.4
1997	9	3.5	4.3
1998	5	2.0	2.4
1999	3	1.2	1.4
2000	6	2.4	2.9
2001	7	2.7	3.4
2002	7	2.7	3.4
2003	5	2.0	2.4
2004	4	1.6	1.9
2005	9	3.5	4.3
2006	1	0.4	0.5
2007	3	1.2	1.4
2008	1	0.4	0.5
2009	1	0.4	0.5
Total	208	81.6	100.0
Missing	45	17.6	
Inapplicable	2	0.8	
Total	255	100.0	

Figure 7: “Museum Date” Plot of Vessels Within the United States.

	Frequency	Percent	Cumulative Percent
1897	1	1.1	1.1
1935	1	1.1	2.2
1941	2	2.2	4.4
1942	1	1.1	5.4
1943	1	1.1	6.5
1948	2	2.2	8.7
1954	1	1.1	9.8
1955	1	1.1	10.9
1957	1	1.1	12.0
1961	1	1.1	13.1
1963	2	2.2	15.2
1964	2	2.2	17.4
1965	1	1.1	18.5
1969	1	1.1	19.6
1970	1	1.1	20.7
1971	2	2.2	22.8
1972	3	3.3	26.1
1973	4	4.3	30.4
1974	3	3.3	33.7
1975	4	4.3	38.1
1976	2	2.2	40.2
1977	3	3.3	43.5
1978	1	1.1	44.6
1979	2	2.2	46.8
1981	3	3.3	50.0
1982	2	2.2	52.2
1984	2	2.2	54.4
1985	1	1.1	55.4
1986	2	2.2	57.6
1988	3	3.3	60.9
1989	1	1.1	62.0
1991	1	1.1	63.1
1992	1	1.1	64.1
1993	1	1.1	65.2
1994	4	4.3	69.6
1995	1	1.1	70.7
1997	2	2.2	72.8
1998	3	3.3	76.1
1999	1	1.1	77.2
2000	4	4.3	81.5
2001	2	2.2	83.7
2002	4	4.3	88.1
2003	2	2.2	90.2
2004	2	2.2	92.4
2005	5	5.4	97.8
2007	1	1.1	98.9
2008	1	1.1	100.0
Total	92	100	

Figure 8: Line Graph Plot of Figure 6.

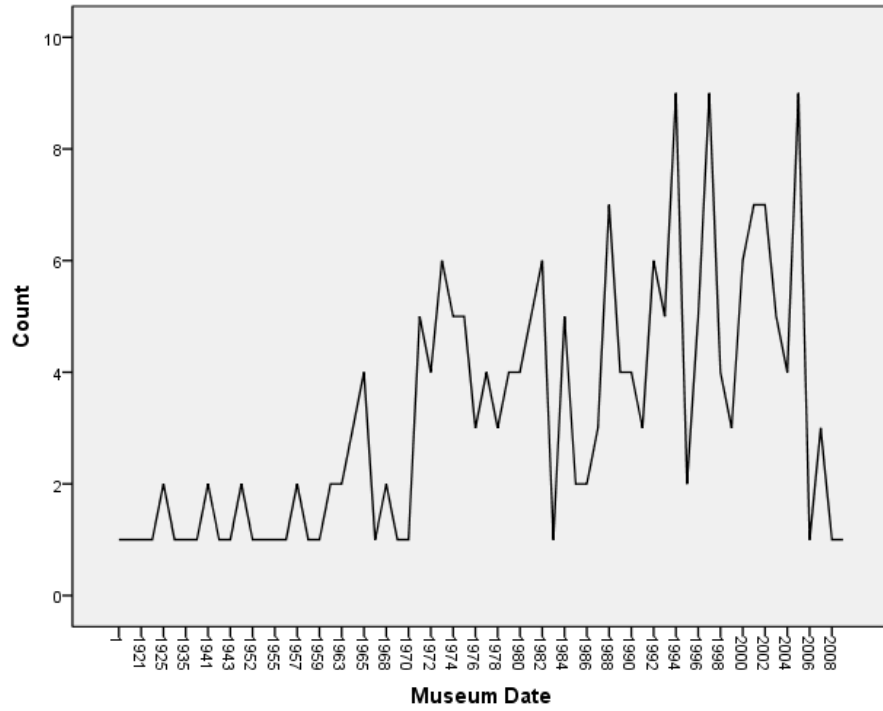
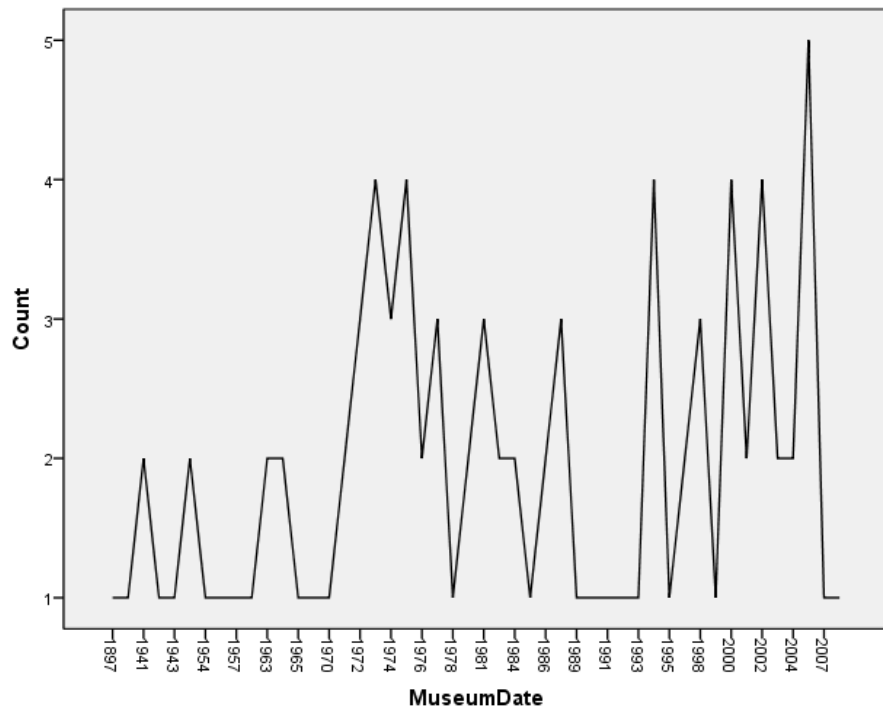


Figure 9: Line Graph Plot of Figure 7.



Including Patriots Point as a case study highlights a significant variable for warship museums – the museum preserving and exhibiting multiple warships. The preservation, curation, and exhibition needs of multi-warship museums are obviously more demanding and expensive. For reasons more thoroughly analyzed in the Patriots Point case section, few museum organizations oversee more than one ship. Figure 10 illustrates the number of cities worldwide with multiple museum warships. This figure accounts for *Ingham*'s 2009 transfer from Patriots Point to the USCGC *Mohawk* museum (Melissa Buchanan 2011, pers. comm.). Fifteen cities, including 6 American cities, have warship museums with as many or more vessels than Patriots Point possessed prior to *Ingham*'s transfer. Three cities – Stockholm, Baltimore, and Washington – have multiple warship museum organizations. No significant preservation or maintenance problems have been reported from those museums. Philadelphia's Independence Seaport administers only *Becuna* and *Olympia*, which is facing major preservation obstacles.

Figure 10: Cities With Four or More Museum Warships (excluding Mt. Pleasant)

City	Frequency
Fall River, US	8
Portsmouth, UK	6
Goteborg, Sweden	5
Honolulu, US	5
Karlskrona, Sweden	5
Stockholm, Sweden	5
Baltimore, US	4
Buffalo, US	4
Chatham, UK	4
Den Helder, Netherlands	4
Hackensack, US	4
Haifa, Israel	4
Horten, Norway	4
Washington	4
Wilhelmshaven	4

When these results are divided by VCN, and Special Conditions such as Dry, Indoors, and Wreck are considered, patterns change. Battleship Cove in Fall River, Massachusetts, oversees eight warships within its museum. The most significant vessel is the battleship *Massachusetts*, but four smaller vessels (All VCN 6) are preserved in a Dry condition; three are also Indoors. The six museum warships in Portsmouth are administered by multiple museum organizations. The Royal Naval Museum administers *Victory*, *MTB-102*, *M-33*, and *MTB-71* (all but *MTB-102* are Dry). *Warrior* and *Mary Rose* are administered by individual museum organizations. Musée maritime de Göteborg and Marinmuseum Karlskrona maintain collections of smaller vessels (VCNs 4-8). Two of the five vessels in Pearl Harbor-Honolulu are Wrecks (*Arizona* and *Utah*); a third is a small suicide torpedo (VCN 6) preserved in a Dry state. After examining these cities, Charleston presents a unique problem with several vessels with no maintenance-reducing special conditions, including *Yorktown* (VCN 1). These conditions have improved according to museum staff, as noted in the Patriots Point case section.

In addition to establishing the statistical significance of the case studies, the database provides several significant trends regarding warship museum location with respect to nationality, operating conditions, and chronological developments. These analyses intend to provide a more complete picture of warship museums worldwide, and are not necessarily intended to directly apply to any of the case studies. As previously mentioned, a number of warship museums are located within countries differing from the original nation. Figure 11 uses a cross-tabulated chart to highlight vessels of different original nationalities.

Figure 11: “Country” versus “Nationality“

Country	Museum Location (Country) * Nation of Origin (Nationality) Crosstabulation																				Total															
	Nationality																																			
	ARG	AUS	A-H	BEL	BRZ	BUL	CAN	CHI	CSA	CYP	DEN	EST	FIN	FRA	GER	GER	GER	ISR	ITL	JAP		MLY	NL	NOR	PAK	PER	POL	RUS	SAF	SPA	SW	TUR	UK	US		
Argentina	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Australia	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	
Belgium	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
Brazil	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	
Bulgaria	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Canada	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	
Chile	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
China	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	
Columbia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Croatia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Denmark	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
Estonia	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Finland	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	
France	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	
Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	14	14	
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	
Hungary	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
Israel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	
Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	
Japan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	
Malaysia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Korea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Norway	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pakistan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peru	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Russia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Africa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Turkey	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ukraine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United States	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	7	1	1	1	1	4	2	3	1	3	1	3	4	8	6	4	1	4	8	7	1	8	5	2	3	1	16	1	2	16	1	23	105	256	

Vessels preserved in countries different from their origins account for 34 of the 255 museum warships (13.3%). Seven American vessels decommissioned by the U.S. Navy and sold to foreign navies were preserved by those countries. The *Pueblo* was attacked, captured, and eventually publicly exhibited by the North Koreans. Ten Russian vessels, predominantly submarines, were decommissioned following the Soviet Union's demise and sold to various private organizations. The United States maintains the highest number of "imported" museum warships; all 13 are either captured Axis or Warsaw Pact vessels obtained post-Cold War.

The final significant analysis this quantitative study will undertake is the elapsed time between the "Decommission Date" and the "Museum Date." Significant differences in these dates with respect to country and vessel classification present avenues for future research. Figure 12 illustrates the frequencies of gaps between a vessel's removal from military service and beginning of its museum use. The difference in the median and mean of Figure 12 results from 11 significant outliers. Nine vessels – *Mary Rose*, *Vasa*, Gunboat *Philadelphia*, *Monitor*, *Hunley*, *Cairo*, *Chattahoochee*, *Jackson*, and *Neuse* – are all recovered sunken or abandoned vessels. *Trincomalee* and *Warrior* spent a significant amount of time as a non-abandoned hulk. Numerous underwater archaeological studies have demonstrated the mitigation of deteriorating effects on submerged shipwrecks. Approximately 40% of *Mary Rose* survived intact. Submergence in mud and dirt insulated the wreck from the destructive forces of its underwater environment (Marsden 2009:20-21). *Philadelphia* was not buried by deposits, but the cold freshwater and lack of sunlight at the wreck site preserved the vessel so well that the lower mast was still intact and upright (Bratten 2002:79).

Figure 12: The “Interregnum”

Difference	Frequency	Percent	Valid Percent	Cumulative Valid Percent
0	28	11.0	13.7	13.7
1	18	7.1	8.8	22.4
2	20	7.8	9.8	32.2
3	13	5.1	6.3	38.5
4	5	2.0	2.4	41.0
5	5	2.0	2.4	43.4
6	6	2.4	2.9	46.3
7	3	1.2	1.5	47.8
8	5	2.0	2.4	50.2
9	6	2.4	2.9	53.2
10	7	2.7	3.4	56.6
11	2	0.8	1.0	57.6
12	4	1.6	2.0	59.5
13	2	0.8	1.0	60.5
14	3	1.2	1.5	62.0
15	1	0.4	0.5	62.4
16	3	1.2	1.5	63.9
17	1	0.4	0.5	64.4
18	5	2.0	2.4	66.8
20	3	1.2	1.5	68.3
21	1	0.4	0.5	68.8
22	2	0.8	1.0	69.8
23	1	0.4	0.5	70.2
24	2	0.8	1.0	71.2
25	1	0.4	0.5	71.7
26	3	1.2	1.5	73.2
27	4	1.6	2.0	75.1
28	4	1.6	2.0	77.1
29	4	1.6	2.0	79.0
30	2	0.8	1.0	80.0
31	1	0.4	0.5	80.5
32	1	0.4	0.5	81.0
33	1	0.4	0.5	81.5
35	2	0.8	1.0	82.4
37	1	0.4	0.5	82.9
38	1	0.4	0.5	83.4
40	1	0.4	0.5	83.9
41	1	0.4	0.5	84.4
42	2	0.8	1.0	85.4
46	2	0.8	1.0	86.3
47	2	0.8	1.0	87.3
48	1	0.4	0.5	87.8
49	1	0.4	0.5	88.3
50	2	0.8	1.0	89.3
51	1	0.4	0.5	89.8
52	1	0.4	0.5	90.2
55	1	0.4	0.5	90.7
56	1	0.4	0.5	91.2
57	1	0.4	0.5	91.7
59	2	0.8	1.0	92.7
76	2	0.8	1.0	93.7
81	1	0.4	0.5	94.1
84	1	0.4	0.5	94.6
88	1	0.4	0.5	95.1
98	2	0.8	1.0	96.1
99	1	0.4	0.5	96.6
115	1	0.4	0.5	97.1
133	1	0.4	0.5	97.6
136	1	0.4	0.5	98.0
140	1	0.4	0.5	98.5
159	1	0.4	0.5	99.0
333	1	0.4	0.5	99.5
437	1	0.4	0.5	100.0
Total	205	80.4	100.0	
Missing	50	19.6		
Total	255	100		

N	Valid	206
	Missing	50
Mean		23.63
Median		8.50
Mode		0
Std. Deviation		46.969
Variance		2206.118
Sum		4867

The most important statistic to extract from Figure 12 is the relatively quick turnaround time for vessels. Half the valid results displayed a gap of eight years or less between “Decommission Date” and “Museum Date.” Individual results for the newly created variable “Interregnum” are difficult to interpret or display with any ease; to rectify this, Figure 13 has been clustered into manageable tiers, creating a “Tier” variable.

Figure 13: Date Differences (“Interregnum”) Clustered (“Tiers”)

Grouped Differences (years)	Tier	Frequency	Percent	Valid Percent	Cumulative Percent
0-5	1	89	34.9	43.4	43.4
6-10	2	27	10.6	13.2	56.6
11-15	3	12	4.7	5.9	62.4
16-20	4	12	4.7	5.9	68.3
21-25	5	7	2.7	3.4	71.7
26-30	6	17	6.7	8.3	80.0
31-40	7	8	3.1	3.9	83.9
41-50	8	11	4.3	5.4	89.3
51-75	9	7	2.7	3.4	92.7
75+	10	15	5.9	7.3	100
	Total	205	80.4	100	
Missing	System	50	19.6		
Total		255	100.0		

Figure 14: Tier-Country Cross Tabulation

Country	Tiers										Total
	1	2	3	4	5	6	7	8	9	10	
Argentina	1	0	0	0	0	0	0	1	0	0	2
Australia	3	1	1	0	0	1	0	1	0	0	7
Belgium	2	0	0	0	0	0	0	0	0	0	2
Brazil	1	1	0	0	0	0	0	0	0	0	2
Bulgaria	1	0	0	0	0	0	0	0	0	0	1
Canada	1	2	0	0	0	0	1	0	0	0	4
Chile	0	0	0	1	0	0	0	0	0	0	1
China	0	0	0	0	0	0	0	0	1	0	1
Columbia	1	0	0	0	0	0	0	0	0	0	1
Croatia	0	0	1	0	0	0	0	0	0	0	1
Denmark	3	0	0	0	0	0	0	0	0	1	4
Estonia	1	0	0	0	0	0	0	0	0	0	1
Finland	1	0	0	0	1	1	0	0	0	0	3
France	2	1	0	0	0	0	1	0	1	0	5
Germany	7	1	2	0	0	1	0	0	0	0	11
Greece	1	0	0	0	0	0	1	0	0	0	2
Hungary	0	0	0	0	0	0	0	0	0	1	1
Israel	1	1	0	0	0	0	0	0	0	0	2
Italy	2	0	1	0	0	0	0	0	0	0	3
Japan	1	0	0	0	0	0	0	0	0	0	1
Netherlands	3	1	0	1	0	0	1	0	0	2	8
North Korea	0	0	0	0	0	0	1	0	0	0	1
Norway	1	0	0	0	0	1	0	0	0	0	2
Pakistan	1	0	0	0	0	0	0	0	0	0	1
Peru	0	1	0	0	0	0	0	0	0	0	1
Poland	1	0	0	0	0	0	0	0	0	0	1
Russia	3	0	1	1	1	0	0	0	0	0	6
Sweden	7	1	0	0	1	2	0	1	0	1	13
Thailand	1	0	0	0	0	0	0	0	0	0	1
Turkey	2	0	0	0	0	0	0	1	0	0	3
Ukraine	1	1	0	0	0	0	0	0	0	0	2
United Kingdom	7	1	1	0	0	2	0	3	2	3	19
United States	33	15	5	9	4	9	3	4	3	7	92
Total	89	27	12	12	7	17	8	11	7	15	205

Figure 15: Tier-VCN Cross Tabulation

VCN	Tiers										Total
	1	2	3	4	5	6	7	8	9	10	
1	2	1	1	0	0	1	0	0	0	0	5
2	5	2	1	2	0	0	0	0	0	0	10
3	5	1	0	0	0	0	2	0	0	0	8
4	10	4	2	3	0	2	0	0	0	0	21
5	17	3	2	2	3	3	1	4	1	8	44
6	11	2	1	0	1	5	1	4	2	0	27
7	33	13	4	3	3	5	1	0	2	2	66
8	5	0	0	1	0	0	0	1	1	4	12
9	0	0	0	0	0	0	0	0	0	1	1
10	1	1	1	1	0	1	3	2	1	0	11
Total	89	27	12	12	7	17	8	11	7	15	205

The first six tiers are spaced as five-year increments. The next two tiers are spaced in ten year increments, and the final tiers in twenty-five-year and longer increments, respectively. The gradual increase in incremental space is necessary to maintain a manageable number of tiers. The last tier represents a span between 76 and 437 years, but as previously mentioned, these numbers are subject to “Wreck” conditions. It is also worth noting that all “Wrecks” or vessels raised intact have been placed in at least “Dry” conditions if not also “Indoors.” The exceptions are *Mary Rose*, *Monitor*, and *H.L. Hunley*. *Mary Rose* is not immersed in water but was constantly sprayed with polyethylene glycol (PEG) to stabilize its wood, and will spend several years drying. *Hunley* and the recovered pieces of *Monitor* are immersed in conservation tanks to prevent corrosion (HNSA 2008:50, 74).

The tables illustrate the ability to sub-divide tiers by several variables. The tiered classification can be applied to both “Country” (Figure 14) and “VCN” (Figure 15). Figure 14 illustrates the relatively even distribution of vessels within the first tier. The desire to begin preserving and maintaining vessels intended for display and exhibition has been consistent worldwide. The most striking statistic to extract from this chart is the high percentage of vessels in “Tiers” 8, 9, and 10 that are located in the United States and United Kingdom.

Figure 15 highlights a more striking disparity. Only 5 of the 44 vessels located within VCNs 1-4 are above Tier 4. This raises the possible conclusion that vessels of larger VCNs become a higher priority for warship museums when available. The oldest “Service Date” of a vessel from VCNs 1-4 is 1895; it is possible that these VCNs are skewed by a relatively recent set of service dates. Figure 16 displays the mean service date for a vessel by VCN; the number of missing entries prevents a proper standard deviation metric for VCN 9. Vessels from VCN 1 are a small and select group; all five are American Second-World-War-era aircraft carriers.

VCN 2 is also dominated by American vessels; nine of the ten museum battleships are American (three from the First World War, six from the second). VCNs 3 and 4 are more diverse. The high standard deviation for VCN 3 is likely due to small sample size. VCN 4 presents low standard deviation from the mean service date despite a smaller sample size. This would deter examples of VCN 4 from higher tiers (in excess of 40 years). VCNs 5, 6, and 7 are the only classifications with large sample sizes, yet present higher deviations than VCNs 1 or 4.

Figure 16: Mean Service Date by VCN

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Service Date * VCN	241	94.1%	15	5.9%	256	100.0%

VCN	Mean	N	Std. Deviation
1	1943.40	5	.894
2	1929.90	10	16.888
3	1924.75	8	25.783
4	1948.57	21	8.225
5	1928.26	50	38.385
6	1949.33	45	20.618
7	1948.96	77	20.573
8	1813.15	13	127.038
9	1862.00	1	.
10	1943.82	11	15.342
Total	1935.07	241	48.248

What emerges from these figures is a concentration of larger warship museums in the United Kingdom and United States, with numerous vessels from both world wars. Larger vessels are more likely to be converted into museums as soon as they are removed from military service. The U.S. Navy is currently seeking museum organization applicants for several Cold-War-era warships, including the aircraft carrier *John F. Kennedy*. Two potential organizations have applied for its donation (NAVSEA 2010). If the carrier, decommissioned in 2007, is not

donated by 2012, the vessel (as a hypothetical entry in the database) would move to Tier 2.

Moving to Tier 3 would require the vessel to remain inactive until 2017, which is unlikely. The case studies will reinforce this research by detailing the maintenance and display problems associated with allowing significant time to elapse between decommissioning and conversion to museum warship.

CHAPTER THREE

CASE STUDY #1: BATTLESHIP *NORTH CAROLINA*

The first case study examines Battleship *North Carolina* in Wilmington, North Carolina. The state-administered, self-funding museum has operated *North Carolina* since 1961. The battleship was in service for six years and was decommissioned shortly after the Second World War. It is one of the oldest warship museums preserving a ship with Second World War service, but because the ship was stricken shortly after the war, the museum can focus on a narrow interpretive historical period.

USS *North Carolina*, the first of two battleships in its class, is the sole vessel preserved by the USS *North Carolina* Battleship Commission in Wilmington, NC. The vessel represents both a lengthy combat service record and a significant evolution in U.S. Navy battleship design. Initially authorized in March 1934, it was the first American battleship designed following the Washington Naval Treaty restrictions (Clayton 2005:1). *North Carolina* incorporated several technological innovations that significantly improved performance and capability compared to dreadnought-era battleships. These included a flush main deck, replacing earlier tripods and cage masts with armored superstructures, secondary armament in turrets instead of casemates, and engines producing in excess of 115,000 shaft horsepower (Blee 2005:3-4). The engine output almost doubled the preceding (but cancelled) South *Dakota*-class' performance and its intended 60,000 shaft horsepower output (Newhart 1995:71)

The vessel's keel was laid down 27 October 1937 in Brooklyn's New York Navy Yard. Hull construction required almost three years. The hull was launched 13 June 1940, a week after the German army occupied Paris (Blee 2005:31). Following launching, *North Carolina* required ten months of "fitting out," the final construction stage. During this phase, a New York radio personality nicknamed *North Carolina* the "Showboat" in homage to a steamboat in a popular

Broadway musical (Blee 2005:39). The battleship was commissioned 9 April 1941 and spent that year undergoing shakedown training. Following the Japanese attack on Pearl Harbor, the crew was recalled from leave; training and testing were completed on an accelerated schedule (Blee 2005:75). The Navy intended it for Pacific service, but the German battleship *Tirpitz* represented a sufficient threat to hold *North Carolina* in the Atlantic until *Washington* was available (Blee 2005:76).

North Carolina transited the Panama Canal 5 June 1942. The battleship, together with the aircraft carrier *Wasp* and several additional vessels, was assigned to Task Force 37 (USS *North Carolina* 1945). The first of the “fast battleships,” now operating as a carrier escort, represented the first implementation of changing Navy doctrine and battleship use. Task Force 37 participated in the Battle of the Eastern Solomons on 24 August. It received its most significant damage on 15 September when the Japanese submarine *I-19* torpedoed *North Carolina*, sank *Wasp*, and destroyer *O’Brien* (Blee 2005:90). Blee located *I-19* survivors and records that confirm all three ships were hit by one torpedo salvo (Blee 2005:90). *North Carolina*’s damage required lengthy repairs. Short-term repairs were conducted at Tongatabu, Tonga, before the ship retired to Pearl Harbor and a lengthy drydock visit. Once repaired, the *North Carolina* returned to combat 9 December 1942.

Its service remained uneventful until the Gilberts Islands invasion in November 1943. *North Carolina* operated primarily as an anti-aircraft escort for aircraft carrier groups, and periodically in a secondary role for shore bombardment. In January 1944, an offensive task force was created to maximize carrier force projection. The overall formation was designated Task Force 38 or 58, dependent on assignment to Third Fleet or Fifth Fleet. The task force’s first campaign was the invasion of the Marshall Islands. Older battleships operated principally as

bombardment platforms. On 29 January 1944, the *North Carolina* sank the freighter *Eiko Maru* during bombardment of Kwajalein Atoll (Blee 2005:103; Clayton 2005:52).

In addition to escort and bombardment roles, the Navy utilized battleship floatplanes to rescue downed aviators. A 30 April aerial attack on Truk resulted in multiple Navy aircraft lost. *North Carolina's* Kingfisher scout planes were dispatched, but one crashed on landing (USS *North Carolina* 1945). The other Kingfisher, piloted by Lieutenant John Burns, rescued 10 aviators, including the other scout pilot. Unable to take off, Burns taxied to the submarine *Tang*, which was also deployed to rescue downed aviators. All personnel were rescued, and Burns earned the Navy Cross for his actions (Blee 2005:105).

In June 1944, the fast battleships bombarded Saipan during the initial stage of the Marianas Islands campaign. The bombardments were conducted to support inshore mine clearing operations and troop landings (Blee 2005:107). The Japanese responded to the Marianas invasion by launching their final major carrier offensive. The resulting engagement became known popularly throughout the Navy as “The Marianas Turkey Shoot”. With the other fast battleships in Task Group 58.7, *North Carolina* provided air defense against those Japanese aircraft not intercepted by American fighters. Following a retaliatory strike against the Japanese fleet, the battleship followed Task Force commander Adm. Marc Mitscher’s unorthodox order to operate searchlights at night. This “radical departure” from normal wartime conditions was taken to facilitate nighttime aircraft recovery, as described later. After the Marianas Campaign, the battleship was detached for an extended overhaul in Puget Sound, Washington.

North Carolina joined Task Force 38 in early November 1944 as carrier operations supported the Philippine Islands counter-invasion. The fleet was forced to defend against increasingly frequent kamikaze attacks. Seasonal typhoons also threatened operations. Despite

American weather data and detection capabilities, the fleet accidentally steamed through the storm (Blee 2005:119). The ship escaped with minimal damage and no loss of life. As Philippine operations moved inland, Task Force operations moved east into the South China Sea seeking remnants of the Japanese Navy. Few ships were located. Most of January 1945 was spent attacking merchant shipping and airfields on the Chinese and French Indo-Chinese coastlines. As American naval operations brought Task Force 38/58 closer to the main Japanese Home Islands and their airfields, conventional and kamikaze attacks increased dramatically. The *North Carolina* continued to operate both as an air defense and bombardment platform. It participated in the first major naval strike against Tokyo on 16-17 February. On 19-22 February, the ship contributed support fire during the Iwo Jima landings.

With Iwo Jima captured, the Task Force returned to attacking the Japanese coast. On 19 March, Japanese bombers crippled the aircraft carrier *Franklin*, directly forward of *North Carolina* in formation. The fast battleships then bombarded Okinawa to prelude invasion. Blee refers to the campaign as “Forty days and nights in the crucible that was Okinawa” (Blee 2005:137). Following the taxing Okinawa campaign, *North Carolina* retired to Pearl Harbor for repairs then rejoined Task Force 38 in July.

The Task Force continued attacking mainland Japan, intending to support a potential invasion in fall 1945. The invasion was preempted by the Japanese surrender. The last wartime action of *North Carolina* was an air-sea rescue on 9 August. As at Truk, two Kingfisher aircraft landed to rescue a downed pilot, but one pilot was thrown from the plane and lost. The second aircraft was able to rescue both pilots (Blee 2005:140-141). Post-surrender, the ship contributed personnel to the first days of occupation before returning to the Atlantic. On 18 October 1945, the *North Carolina* arrived in Boston, ending an almost four-year deployment (USS *North*

Carolina 1945). From November 1945 until June 1947, the Navy used the battleship for midshipmen training. Decommissioned on 27 June 1947, *North Carolina* was “mothballed” with the Reserve Fleet at Bayonne, New Jersey.

North Carolina remained at Bayonne until the Navy began culling the reserve fleet. On 1 June 1960, the U.S. Navy marked *North Carolina* and five other fast battleships for disposal. As previously mentioned, this was a period of increased warship preservation activity. Three fast battleships – *North Carolina*, *Alabama*, and *Massachusetts* – were preserved by state or other non-profit organizations.

The state of North Carolina mobilized its citizens in a fundraising effort (Blee 2005; 145). This included a statewide initiative by children to save and donate coins for the ship’s preservation. The *North Carolina* was moved to a berth across the Cape Fear River from downtown Wilmington in September 1961. Operated by the USS *North Carolina* Battleship Commission, the vessel has been maintained as a museum since April 1962. The Commission is under the oversight of the North Carolina Department of Cultural Resources’ (NC-DCR) Division of Historic Sites, but the museum is financially self-sufficient (Kim Sincox 2007, pers. comm.). It receives no state funding for operations, though the staff are state employees. Battleship *North Carolina*, the museum organization operated by the Commission, conducts its own marketing, but NCDCCR includes the battleship in its umbrella advertising of all historic sites (*North Carolina* 2009b). Battleship *North Carolina*’s mission is to operate the ship as a museum and memorial to the *North Carolina*’s history and commemorate the service of North Carolinians during the Second World War.

The *North Carolina* rests in several feet of mud in a berth carved out of Eagle’s Island, the Cape Fear River’s western bank. The berth is subject to tidal fluctuations, but the location is

sufficiently upriver to minimize the impact of hurricane weather (Roger Miller 2007, pers. comm.). A building adjacent to the vessel contains a ticket office, small theater, limited exhibit space, gift shop, and other logistical facilities. The vessel houses offices for the majority of the museum's staff on board. The main staff facility is located on decks 02 and 03, utilizing the captain's quarters and wardroom. A second staff area, located in the petty officers' wardroom and lounge on the second deck, houses museum operations, curation staff, ship's library, and artifact collection (Photograph 1). These spaces have been modified since the Commission acquired the vessel to accommodate modern HVAC equipment (Roger Miller 2007, pers. comm.). The *North Carolina*'s service ended decades before the Navy retro-fitted air conditioning on older vessels still in service. Installation and subsequent maintenance of air conditioning equipment required Navy approval, and was conducted so as to minimize alterations to the ship's structure (Roger Miller 2007, pers. comm.). No exhibit spaces are climate-controlled except the officer's wardroom. That compartment on Deck 01 contains the Roll of Honor, a series of plaques displaying the names of all North Carolina natives killed while serving in the Second World War (Photograph 2). The space was modified for climate control because it is located directly beneath staff spaces on Decks 02 and 03.



Photograph 1: Battleship *North Carolina*'s archives, located in the Chief Petty Officer's Quarters.



Photograph 2: The officer's wardroom and lounge, converted to house the museum's Roll of Honor and other exhibits.

Battleship *North Carolina*'s Executive Director is chosen by the Commission. The Commission uses criteria similar to terrestrial museums, with one significant addition. The Director must have been a military officer of Rank O-5 or above (Kim Sincox 2007, pers.

comm.). The Navy's O-5 rank of commander is typical for executive officers of larger warships. The Commission has taken great care in past and recent director searches to ensure directors understand the unique nature of directing a warship museum. The previous Director, Capt. Dave Scheu (US Navy, Retired) placed an emphasis on historical interpretation, and emphasized historical accuracy in exhibition (Mary Ames Sheret 2007, pers. comm.). Captain Scheu retired at the end of March 2009. The Commission selected Capt. Terry Bragg (US Navy, Retired) to replace Scheu. Captain Bragg's skill set is more focused on marketing, which received greater emphasis from the Commission during the 2008 search for a new director.

Responsibility for historical interpretation, research, and curation is divided into two positions – the Museum Services Director and the Curator of Collections (*North Carolina* 2007a). Both work in the petty officer's ward room and lounge spaces. The Museum Services Director is charged with maintaining the museum's exhibits, tour route, designing signage, and planning special tours (Kim Sincox 2007, pers. comm.). Signage production is contracted to external graphics publishing companies (Photograph 3). The Curator of Collections is responsible for maintaining the library, paper records, and artifact collection (Mary Ames Sheret 2007, pers. comm.). The museum maintains the library and archive for its own purposes, but permits members of the public to conduct research upon request. To facilitate easier public access, most crew members' personal collections have been duplicated and shared with East Carolina University's Joyner Library's Special Collections. All documents and objects within the collection are cataloged and classified using standard accession methods. Every artifact has an accession number corresponding to the year of accession, the collection lot number, and the collection item number. The catalog database is managed using Past Perfect software (*North Carolina* 2007c). Most of *North Carolina's* paper records were left on board when the vessel

was mothballed, and now constitute the vast majority of the library's archive material (Kim Sincox 2007, pers. comm.).



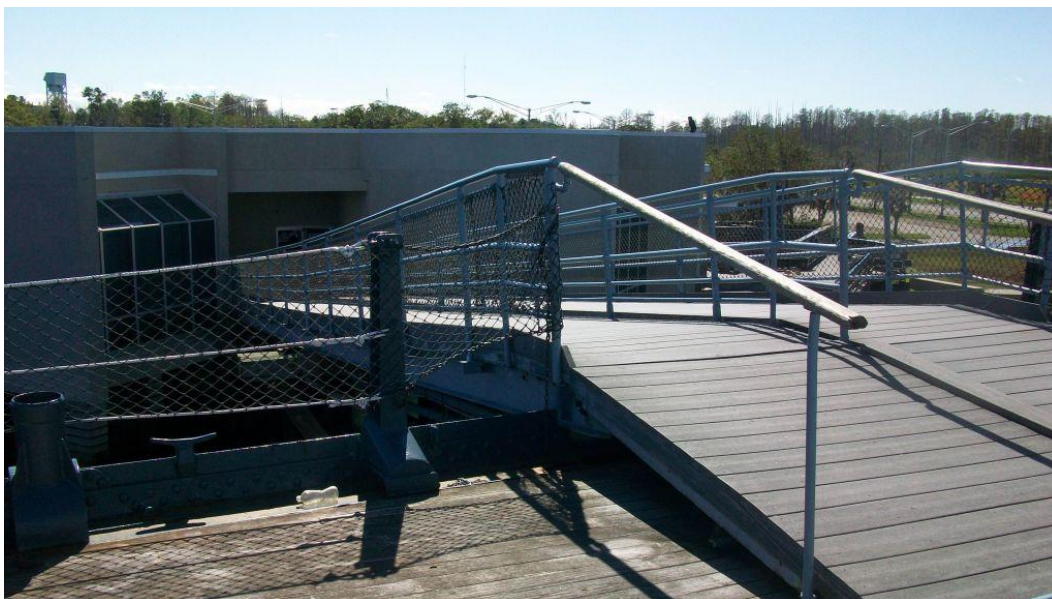
Photograph 3: Print Shop exhibit. The hard plastic labels are created by a contracted graphics design company (Kim Sincox 2009, pers. comm.)

The *North Carolina* has limited climate-controlled space for artifact and document storage. The artifact collection exceeded 10,000 items as of September 2007 (Mary Ames Sheret 2007, pers. comm.). The museum has established a specific and extensive collection policy. The collection's scope of acquisition is limited to items related to warships named *North Carolina*, a member of the crew, or representative of those items used during the ship's service (*North Carolina* 2007b). A total of six warships have been named *North Carolina*, including a sailing ship, a Confederate ironclad, an armored cruiser, and a nuclear attack submarine. Items associated with the armored cruiser (ACR-12), which served during the First World War, comprise the most significant portion of the collection after the battleship (Kim Sincox 2007, pers. comm.). A *Virginia*-class attack submarine (SSN-777) was commissioned in 2008, but the museum staff has been active in collecting material related to the submarine since construction commenced. The battleship staff maintains contact with the Naval Historical

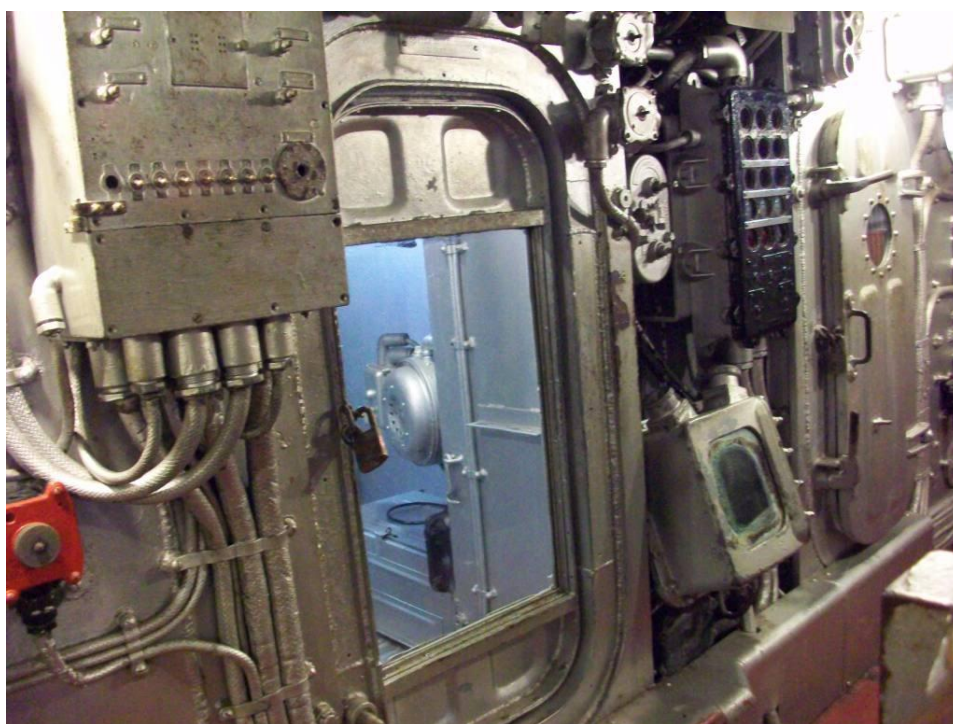
Center (NHC) to create new mechanisms for naval historical preservation and interpretation utilizing SSN-777 as a test bed (*North Carolina* 2007d).

The museum also collected items related to the battleship from non-traditional sources. On 30 January 1944, the battleship was approaching the Roi and Namur islands, Kwajalein Atoll, to bombard shore positions. The crew spotted the freighter *Eiko Maru #2* anchored off-shore and fired on the ship with the main batteries. The freighter was hit on the second salvo, and rapidly sank (*North Carolina* 2007e). In 1990 a CRM firm dove on the wreck of *Eiko Maru #2* and recovered a bowl and two bottles used by the crew (*North Carolina* 2007e). The artifacts were preserved and eventually donated to Battleship *North Carolina*. They have yet to be exhibited.

The museum operates a single self-guided tour route that proceeds through lower and main deck spaces. The public boards the ship via a gangway between the terrestrial facility and the aft port quarter (Photograph 4). This allows immediate public access to the fantail, a space often used for special events (as discussed below). Turret #3, the aft turret, is open for public inspection (Photographs 5, 6). No significant modifications have been made to facilitate public access. The below-deck tour route includes the engine room, selected ship's offices and crew services, and Turret #2's magazine and ammunition hoist. Tours descend to the third and fourth decks through multiple stairwells, potentially challenging for some visitors. The route begins in aft spaces and traverses significant locations on the main deck, second deck, and the forward superstructure.



Photograph 4: Access gangway linking terrestrial facility and vessel.

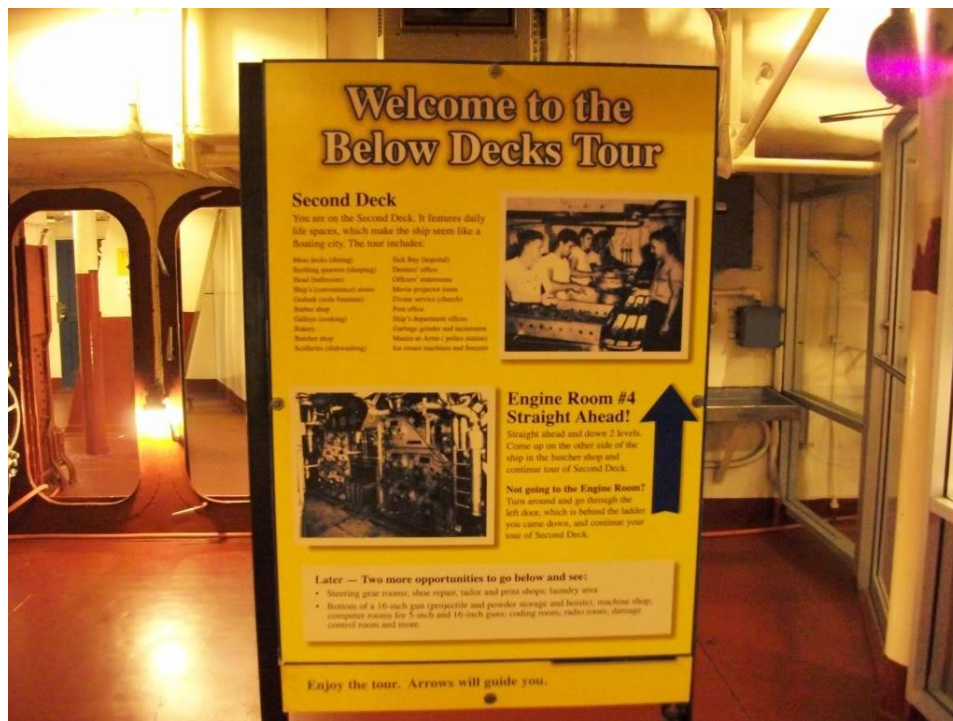


Photograph 5: Hatch to left gun room inside Turret #3. A section has been removed and replaced with Plexiglas to allow improved viewing.



Photograph 6: Display inside Turret #3's center gun room, illustrating the main battery loading process with white silhouette mannequins.

The tour route's internal portion begins on second deck, traversing selected spaces, then ascends to main deck spaces before exiting to the forward main deck. The tour is designed to show a broad representation of the living, working, and combat conditions on board the battleship, with minimal redundancies. The route is clearly marked, using directional signage to guide visitors (Photographs 7, 8). Hatchways along the tour route have been modified to facilitate easier public access, as described in greater detail below. Vandalism and theft have been minor issues over the years, prompting the museum to use Plexiglas to block entryways or cordon off some spaces. In the engine room, Plexiglas is used to allow visitors to see internal machinery. Security cameras provide additional deterrence (Kim Sincox; Mary Ames Sheret 2007, pers. comm.).



Photograph 7: Signage for main tour route.



Photograph 8: The museum simplifies wayfinding using well-illustrated optional tour route sections.

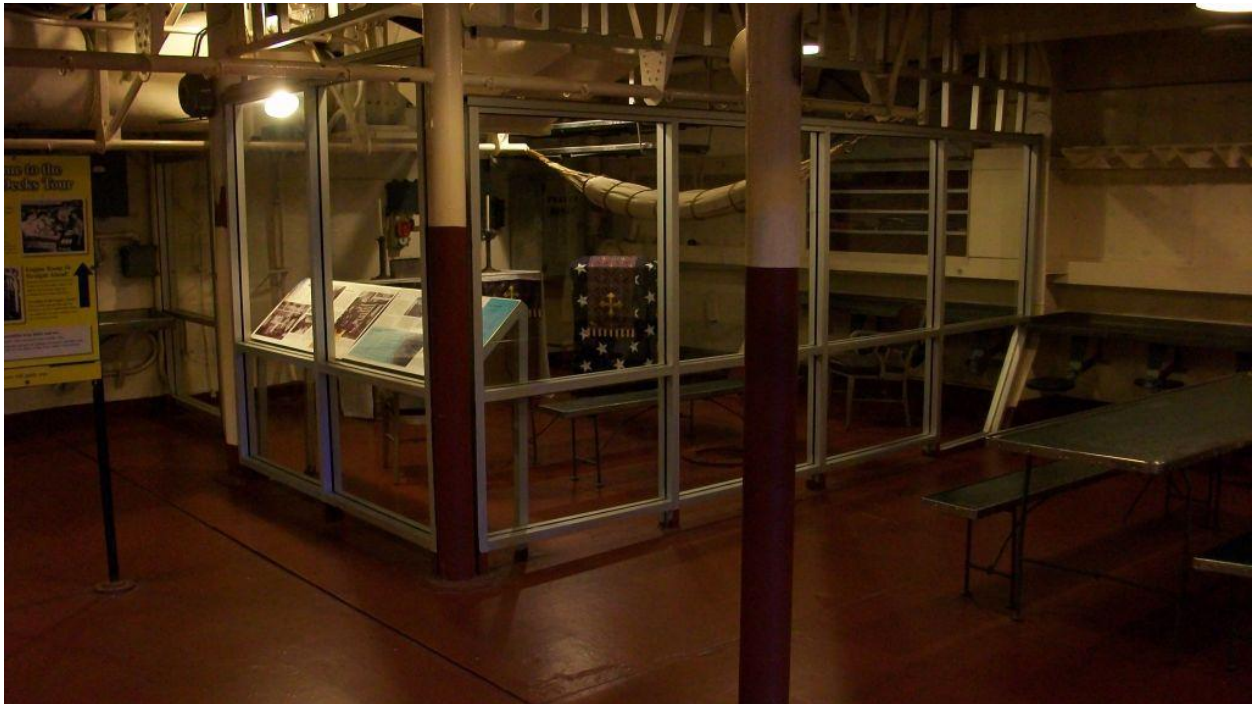
Regardless of security or access issues, visitors cannot interact with some spaces. To better illustrate the perspective of sailors working in size-constrained quarters, many exhibit spaces feature flat white plastic cutouts resembling sailors performing various actions. The

cutouts help interpret working conditions while minimizing material costs. The museum staff has noted that other museums engage in similar activities, particularly HMS *Belfast* in London. *Belfast* utilizes three-dimensional mannequins wearing authentic replica uniforms, a measure many museums cannot afford (Kim Sincox; Mary Ames Sheret 2007, pers. comm.). Signage is principally two-tone – either blue and white or blue and yellow – to facilitate reading in both exterior and interior spaces. External signage has proven difficult to maintain (Kim Sincox 2007, pers. comm.). Signs are either poster-board sandwiched between two layers of Plexiglas (for signage with significant graphic content), or printed on sheet metal (textual content). Posterboard wears rapidly in high-humidity environments, and the Plexiglas covering traps moisture (Photograph 9). Metal signs retain and conduct heat, a potential safety hazard during Wilmington’s summer heat.



Photograph 9: OS2U Kingfisher signage in 2009, showing effects of moisture collecting under Plexiglas covering. The signage has since been replaced.

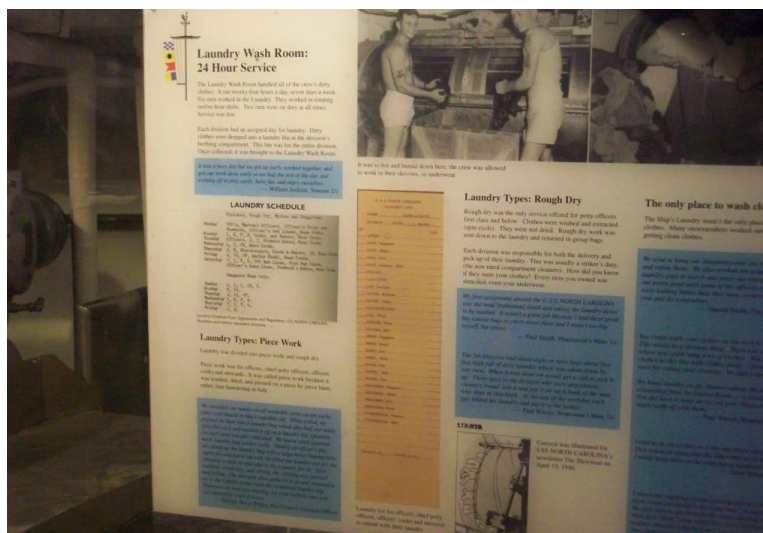
The main tour route emphasizes the unique nature of life on board a battleship. The tour traverses living spaces, including crew berthing, officers' staterooms, crew mess, and a non-functioning crew head. The crew mess spaces exhibit modifications for a movie projection booth and chapel services (Photograph 10). Non-combat working spaces include ship's stores, a soda fountain, freezers, the galley, the bakery, the butcher's shop, sculleries, the sick bay, the dentist's office, the brig, laundry services (Photographs 11, 12) the barber shop, the post office, and a garbage disposal (grinder and incinerator). The tour also features several ship department offices, such as printing, photography, tool dispensary, machinery shop, and radio communications. The museum staff designed these exhibits to incorporate oral history extracts, cartoons, the public address system, and other elements to present information and engage visitors.



Photograph 10: One of the crew mess spaces, with chapel exhibit



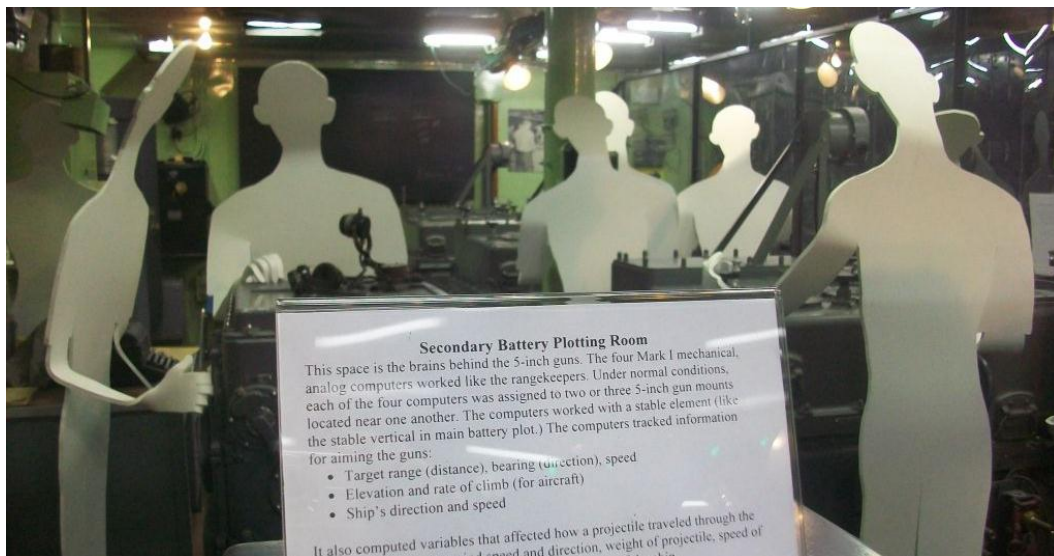
Photograph 11: Laundry Pressing Room exhibit.



Photograph 12: Laundry Room signage. Interior signage is less susceptible to moisture collection.

Interpreting *North Carolina's* combat functions is more difficult. The main tour route includes the Combat Information Center (CIC) and fire plotting rooms (Photograph 13). The engine room, turrets, and bridge present access issues (Photograph 14). In the mid-1990s, Battleship *North Carolina* received Navy approval to modify Turret #2 for easier public access

(Photographs 15, 16, 17). An entry was cut through the turret's armor, allowing tours into the magazine and shell hoist spaces (Roger Miller 2007, pers. comm.).



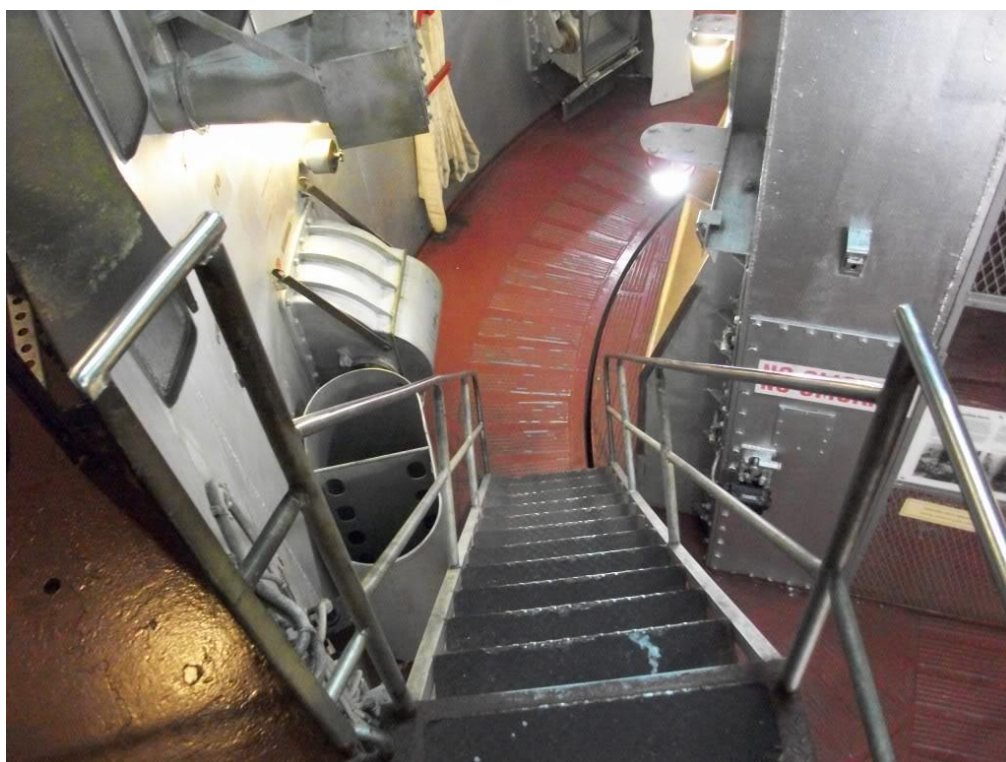
Photograph 13: Secondary Battery Plotting Room, enclosed with Plexiglas. The mannequins illustrate the cramped nature of *North Carolina's* combat spaces.



Photograph 14: *North Carolina's* bridge. Restoration of the Bridge and Chart Room began in 2011 (Roger Miller 2011, pers. comm.).



Photograph 15: Entryway cut through magazine armor below Turret #2.



Photograph 16: Access ladder added to #2 Magazine's mezzanine.

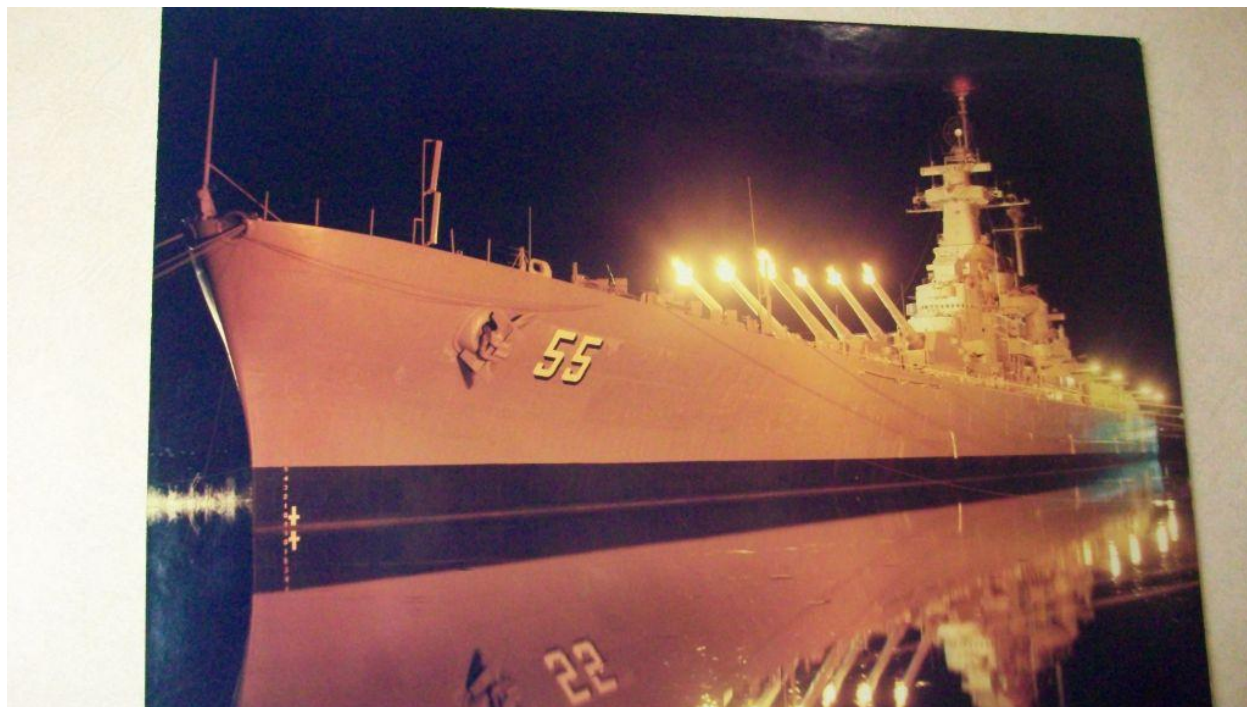


Photograph 17: Reverse view of access ladder.

The museum has been consistently active in developing non-standard methods of generating public interest and attendance. It offers some tour events, highlighting spaces or directed towards more specific interests. “Hidden Battleship” is a lengthy guided tour that allows visitors with a desire for a more thorough historical interpretation to spaces not located on the standard tour route. The “Power Plant Program” is another tour catering to special visitor interests. This volunteer-guided tour traverses machinery spaces, and places an emphasis on the ship’s propulsion (North Carolina 2007i). The Museum also takes advantage of living history volunteers. The “Battleship Alive” program places live interpreters in various locations demonstrating routine duties, and highlighting the vessel’s simultaneous function as both instrument of war and city at sea.

Not every interpretive concept stands the test of time. Shortly after the museum was established, the staff created an outdoor theatrical light and sound show. “The Immortal

“Showboat” was an hour-long production billed as family entertainment and operated during summer months (*North Carolina* 2007g). Spotlights concealed in gun barrels and concert stereo speakers provided a pre-recorded drama with no live actors (Photograph 18). The museum successfully ran the production for many years, part of a unique abundance of outdoor historical dramas in North Carolina. The show was discontinued in the early 1990’s, due to technological obsolescence and dwindling attendance. Popular entertainment at the end of the twentieth century became increasingly reliant on electronics, but the outdated program offered a unique audio experience. No static display can fully convey the effect of firing large weapons such as the *North Carolina*’s sixteen-inch guns, and the approximation of the sound through the outdoor drama represented a unique and opportune aspect of the warship museum.



Photograph 18: “The Immortal Showboat” promotional photograph (Battleship *North Carolina* archives).

The *North Carolina* has been situated in the same location for almost 50 years. The Wilmington area experiences mild winters and hot, humid summers marked by periods of

increased hurricane and tropical storm activity. Battleship *North Carolina*'s maintenance needs are not as intensive as other warship museum sites due to two factors – the relatively sheltered site location and the museum's single-warship responsibility. The staff Maintenance Director is also currently the Assistant Director due to the emphasis on maintenance, from painting and rust removal to significant issues such as deck and hull conservation.

The *North Carolina* sported a flat gray paint scheme when it arrived in Wilmington. This scheme was retained for ease of material costs until donations in the 1990's allowed the museum to repaint the vessel (Roger Miller 2007, pers. comm.). The revised paint scheme approximates the US Navy Measure 32 dazzle camouflage (Photograph 19) that adorned the battleship during most of 1944 (Williams 2001:180-190). Paint represents the largest single material cost for museum maintenance (Roger Miller 2007, pers. comm.). In addition to repainting the vessel, the museum restored the teak wooden decking (Photograph 20, 21). The original surface suffered from deterioration in the hot and humid Wilmington summers. The deck was replaced in 1999 with teak donated by the Union of Myanmar Minister of Forestry. The Myanmar government conducted business with a wood importation firm in Wilmington, became aware of the North Carolina's wartime role, and donated the wood as a gift (Roger Miller 13 Sept 2007).



Photograph 19: *North Carolina's* Measure 32 camouflage, used during 1944.



Photograph 20: *North Carolina's* restored teak deck, viewed abaft Turret #3. The tour route access hatchway is visible adjacent to Turret #3.



Photograph 21: The museum's deck workshop, located on the starboard side of Deck 02. The workshop is only visible to the public from the upper levels of the superstructure.

Vessel maintenance also involves structural modifications. Of the three sites considered for this research, Battleship *North Carolina's* staff made the most structural alterations to facilitate visitor access. The battleship has made significant efforts not only to facilitate access but also in making modifications to satisfy the Navy's Ship Donation Inspection Program. As previously stated, several hatchways along the main tour route have been modified. Hatch coamings, vertical surfaces raised above deck to prevent water flowing into openings, have been removed from selected hatchways. To satisfy Navy policies on ship modifications, the removed coamings were marked, recorded, and stored in non-visitor areas as close to the modified hatch as possible (Roger Miller 2007, pers. comm.).



Photograph 22: A hatch removed to facilitate visitor access to an engine room.

Other modifications were made to increase visibility within interior spaces, particularly officers' quarters or ship's offices. Plexiglas barriers are common along tour routes. To allow visitors to see spaces without creating access difficulties, or to prevent theft and vandalism in fully furnished spaces, maintenance staff have removed portions of interior bulkheads and replaced them with Plexiglas barriers. This artificial viewpoint is a carefully considered concession, and the same recording and storage methods used for hatch comings are employed with removed bulkheads. When a tour route ascends or descends decks, hatchways are modified to improve safety and access. Some hatchways were fitted with stairs with deeper treads – a

concession to safety which occasionally impeded exhibition (Photograph 23). Railings were installed along most stairways (Photograph 24).



Photograph 23: Lower Handling Room for a starboard 5'' turret, with hatch partially removed for viewing. The addition of ladders along the tour route occasionally poses obstructions.



Photograph 24: Detail of railings installed by the museum for visitor safety and access.

The most significant modification involved opening Turret #2 to public access. No other warship museum has made such an effort to interpret a battleship's intended primary function – firing the main guns. The turret's two-foot-thick armor was cut open, and stairways installed between the shell storage and main hoist levels. In addition to removing armor and bulkheads to improve access, the museum installed fencing in some locations to prevent visitors from entering unsafe hoist mechanism areas (Roger Miller 2007, pers. comm.).

Battleship *North Carolina* is not immune to the major conservation issues plaguing many warship museums. The museum monitors the ship's condition, but when the "Immortal Showboat" came to rest in the mud of Eagle's Island, the hull's long-term sustainability was not a concern. As a result, the hull now requires major conservation efforts. The island's soil, the mud in *North Carolina*'s berth, is highly acidic. Any gaps in the paint on submerged sections of the ferrous-metal hull allow increase oxidation (Friedman and Damian 2007:3-4). Threats to the

hull exist inboard as well. Fuel tank interior surfaces are subject to corrosive effects of oil and polychlorinated biphenyls (PCBs), a toxic pollutant in fuel used during North Carolina's service (Friedman and Damian 2007:7). When the battleship settled into its berth, fuel tanks were emptied and partially filled with water, introducing remaining PCBs into the water/oil mixture. This mixture can contribute to increased corrosion. Corrosion can be complicated by material containing asbestos attached to machinery such as fuel tank manifolds. Conservation research indicated that material containing asbestos has been sufficiently sealed to prevent the airborne release of asbestos fibers (Friedman and Damian 2007:6-7).

The Commission and museum want to remove *North Carolina* from the water to conduct necessary preservation efforts. This would require significant financial impacts on the museum. Originally, the Commission and then-Executive Director Scheu decided the most efficient method would be moving the *North Carolina* from its berth and towing it to the closest available drydock in Norfolk, Virginia, or Charleston, SC. This plan included a number of difficulties, the greatest involving the battleship's six- to twelve-month absence from its museum location. The absence of admission funding could be potentially crippling. The transit of open ocean water also presented potential increased corrosion rates if the hull's paint were compromised further by the transit (Friedman and Damian 2007:20).

The Commission and museum staff have reconsidered this decision, especially in light of the 2008 economic recession. The Commission voted to conduct hull repairs on-site on 31 May 2010 (*North Carolina* 2010). The decision is expected to save approximately \$16 million in transportation costs and lost admission revenue. Plans for the conservation and repair process have not been finalized. A test case was conducted in fall 2010 with a cofferdam around the starboard bow section. This method was partially inspired by installation of a full cofferdam

surrounding USS *Alabama* in 2002, a protective measure that also mitigated damage during Hurricane Katrina in 2005 (Charles Breeland 2007; Roger Miller 2011, pers. comm.). The Commission is currently seeking engineering plans for a full cofferdam. Once the full cofferdam is constructed, the museum plans to drain the berth and excavate it. The berth will then be re-flooded, and repairs will be conducted by underwater divers (Roger Miller 2011, pers. comm.).

Conservation needs and preservation costs are dependent on a key factor: visitor attendance and public interest. Battleship *North Carolina* has placed increased emphasis on finding new avenues of raising public interest without sacrificing historical context. The core funding is admission revenue. Despite the recent economic downturn, the museum saw an increase in attendance between 2007 and 2009. Attendance in 2009 alone was 206,965 people, the highest total since 2002 (*North Carolina* 2009a). Maintaining increased attendance involves events such as the specialty tours and living history events. The museum also maintains an active relationship with local Boy and Girl Scout programs. Insurance regulations do not permit Battleship North Carolina to conduct overnight group events that other warship museums conduct (Kim Sincox 2007, pers. comm.).

The museum has also been proactive in recruiting Wilmington's television industry. Several television programs in recent years have paid usage fees for the battleship or adjacent park. In particular, the battleship became popular during the past decade for its appeal to supernatural enthusiasts. The Japanese torpedo attack of 24 August 1942 resulted in several casualties, and that incident generated an urban legend of paranormal activity aboard the vessel. Several ghost detective programs have been filmed on board the vessel, and the museum staff realized the increased appeal generated fees for these programs (Heather Loftin 2009, pers. comm.).

With increased visitation and the relative stability of the museum's organization, Battleship *North Carolina* has avoided the struggles of other warship museums, such as Patriots Point and Independence Seaport. The Commission's biggest advantage is its clear and concise organizational mission supporting one vessel. The museum also benefits from the strongest curatorial and collections policies of all three case study sites. Other warship museum staffs acknowledged *North Carolina*'s superior reputation in curatorial operations (F.W. "Rocco" Montesano 2010, pers. comm.). The Wilmington area is not as populous as other cities hosting warship museums with capital ships, but community and regional organizational support is second only to admission revenue for museum funding (Kim Sincox 2007, pers. comm.).

If Battleship *North Carolina* is lacking in any museum function, it is a lack of integrating technology into exhibits. Other museums have sought increased audio and video elements, including computer terminals, in spaces throughout their vessels. *Yorktown*'s experiments with computer terminals and *Lexington*'s use of video monitors indicate *North Carolina* could better utilize visual technology. The battleship's 1 Main Circuit (1MC) public address system is used to broadcast announcements and localized speakers in the crew mess play period music. The most significant audio element a battleship can convey is the sound of the main guns firing. The outdoor program attempted this, but given more recent advancements in computer technology it might be possible to replicate the sound of firing the main battery. This would require creating a sound that conveyed the battle noise without presenting danger to visitors. Outside of technological issues, the battleship's only drawback is the lack of several pieces of equipment significant to its Second-World-War-era configuration. The aircraft crane and catapults were removed prior to entering "mothballs," and were never replaced when the ship was donated. Though some 20mm and 40mm anti-aircraft guns remain, most were removed. Neither set of

missing pieces severely inhibits historical interpretation, though the presence of at least one catapult would improve the Kingfisher exhibit (Photograph 25).



Photograph 25: Restored OS2U Kingfisher located next to port catapult mount.

In 2006 several prominent Wilmington individuals began examining the possibility of acquiring the Cold-War-era aircraft carrier *Kitty Hawk*. The aircraft carrier has been decommissioned, but the Navy plans to retain it in reserve until 2015 (US Navy 2009d). The applicant organization's process should be closely studied. Museums preserving large warships require substantial population bases from which to draw resources, and Wilmington is far smaller than either Charleston or Corpus Christi. The arrival of a second capital warship museum could financially hinder Battleship North Carolina's efforts to be proactive regarding its preservation issues.



Photograph 26: Creative exhibit in the crew's showers.

CHAPTER FOUR

CASE STUDY #2: PATRIOTS POINT NAVAL & MARITIME MUSEUM

The second case is Patriots Point Naval & Maritime Museum in Charleston, South Carolina. Patriots Point is also state-administered and self-funded, though the site recently required significant external loans for emergency repairs. The site currently consists of the aircraft carrier *Yorktown*, destroyer *Laffey* (off-site and inaccessible to the public), and submarine *Clamagore*. *Yorktown* and *Laffey* entered service during the Second World War, while *Clamagore* was undergoing post-commissioning training when the war ended. All three ships operated into the early 1970's, and received post-war modifications as part of modernization efforts. Patriots Point has also operated several other vessels since its opening. The museum has preserved a myriad of ships with a wide interpretive historical period spanning multiple eras of warfare.

Patriots Point Naval & Maritime Museum currently maintains three vessels as warship museums – the aircraft carrier *Yorktown* (CV-10), destroyer *Laffey* (DD-724), and submarine *Clamagore* (SS-343). *Laffey* currently is not available for public viewing; following drydock repairs in 2009-2010, the vessel remains berthed at the former Charleston Navy Yard. At the time of on-site research in June 2009, the museum also included the Coast Guard cutter *Ingham* (WHEC-35), which has since been transferred to the Miami Dade Historical Maritime Museum. The museum also formerly included the nuclear merchant vessel NS *Savannah* and Coast Guard cutter *Comanche* (WPG-76). In addition to these vessels and numerous aircraft exhibited on board *Yorktown*, the museum includes a replica Vietnam War U.S. Navy Advanced Tactical Support Base (ATSB). The ATSB includes four restored helicopters and a Mark I River Patrol Boat (PBR), not included under the aegis of this research.

The original non-profit organization administering the museum was the Patriots Point Development Authority. In 1991 the museum was transferred to the South Carolina Department of Parks, Recreation, and Tourism (South Carolina 1991:S 0050). The organization is a South Carolina state agency with a mandate to be self-sustaining; no regularly appropriated funding is provided by the state's General Assembly (David Clark 2009, pers. comm.). The museum received a loan from the Assembly in 2009 to conduct urgent repairs, as detailed below. The four vessels present during on-site research were all constructed within a ten-year window (between 1936 and 1945). Not every vessel participated in wartime service, but all four operated as active military vessels in the post-war decades. All four vessels also received significant modifications, modernization efforts to extend their service lives and improve their combat capabilities.

The *Essex*-class aircraft carriers were designed in the late 1930's following removal of interwar treaty restrictions on capital ship tonnage (Terzibaschitsch 1980:57). The class was designed to meet specifications requested by Navy leadership, which recognized the changing nature of naval warfare. CV-10 was the second *Essex*-class aircraft carrier authorized, and was built by the Newport News, Virginia, Shipbuilding and Dry Dock Company (Conway 1980:104). The vessel was originally assigned the name *Bon Homme Richard*, but Secretary of the Navy Knox renamed CV-10 to honor the aircraft carrier *Yorktown* (CV-5) lost during the Battle of Midway in June 1942 (Cressman 1985:179). The ship was commissioned on 15 April 1943. Following flight training, the carrier was dispatched to the Caribbean for its shakedown cruise (Reynolds 1986:10-11). *Yorktown*'s air complement included F6F Hellcat fighters, SB2C Helldiver dive-bombers, and TBF Avenger torpedo bombers. These aircraft were designed and refined following early-war operational experience (Reynolds 1986:10). Mechanical problems

with the Helldivers caused the commanding officer to replace them with older, more reliable SBD Dauntlesses (Reynolds 1986:20-21). The Dauntless complement was permanently replaced with Helldivers in May 1944 (Reynolds 1986:134).

As one of the Navy's first new and improved aircraft carriers, *Yorktown* was assigned still and film photographers. The Navy intended to use the carrier for publicity purposes. Footage shot on board during the *Yorktown*'s transit to the Pacific Theater was used in both Navy documentaries and in commercial films (Reynolds 1986:13). The ship transited the Panama Canal 10-12 June 1943, and proceeded directly to Pearl Harbor. When *Yorktown* arrived at Pearl Harbor in late July, *Enterprise* was undergoing a major overhaul. The U.S. Navy had only four fleet carriers available for combat duty – *Yorktown*, *Essex*, the venerable *Saratoga*, and the cruiser-turned-light carrier *Independence* (Reynolds 1986:25). American carrier forces were being mustered for the Gilbert Islands invasion. Before the first major invasion of the Central Pacific occurred, *Yorktown* was ordered on a series of tactical raids on forward Japanese bases. In late August, the carrier was dispatched its first combat operation – air strikes on Marcus Island (Reynolds 1986:45). Following a supply run to San Francisco, the ship conducted an attack on Wake Island.

In November, *Yorktown* joined the new carriers and escorting battleships assembled for the Gilbert Islands invasion. This was the first offensive undertaken by the Fast Carrier Task Force. The offensive operation began with air strikes to neutralize airfields, followed by landings on Makin and Tarawa Atolls on 20 November. *Yorktown*'s aircraft were assigned to support the Makin landings. The ship's pilots suffered from a lack of targets, as other air groups were unable to effectively assist the Marines' difficult attack on Tarawa (Reynolds 1986:64).

Yorktown's carrier group conducted follow-up raids on Kwajalein Atoll in early December before retiring to Pearl Harbor. The carrier remained in port through the end of 1943.

In January 1944, *Yorktown* was included among carriers assigned to Task Force 58, Fifth Fleet. It served as Admiral Marc Mitscher's flagship for the Fast Carrier Task Force during the invasion of the Marshall Islands. The campaign began with air strikes on island facilities leading up to 31 January landings on Ennylabegan and Enubuj and 1 February landings on Kwajalein, Roi, and Mamur (Reynolds 1986:89-90). The under-defended islands did not offer significant resistance.

Following neutralization of defenses in the Marshall Islands, Task Force 58 was ordered to attack the Japanese base at Truk. The offensive commenced on 16 February. American aircraft encountered Japanese fighters over the islands, but superior American numbers, planes, and positioning turned the air engagement into what one pilot described as "flushing quail" (Reynolds 1986:98). Japanese warships in the lagoon attempted to escape the air assault, but provided little more than a target-rich environment for American bomber pilots. The following day, reconnaissance aircraft determined no targets remained warranting another attack. The Fast Carrier Task Force withdrew from its first major combat operation with only one damaged carrier (*Intrepid*). The strikes also convinced Navy leadership that an invasion of Truk was unnecessary (Reynolds 1986:108)

Yorktown and the Task Force attacked the Marianas in late February as a prelude to the planned invasion. The carrier force was diverted to the Southern Pacific to support Gen. Douglas MacArthur's offensive in New Guinea (Reynolds 1986:109). *Yorktown*'s aircraft attacked Palau on 30 and 31 March and sank the destroyer *Wakatake*. Further attacks on Hollandia were scheduled for 23 April, but MacArthur's forces found Japanese defenses largely

abandoned (Reynolds 1986:123-124). As *Yorktown* and the Task Force withdrew toward a rear area anchorage, it conducted a second strike on Truk on 29-30 April. Before returning to Pearl Harbor 16 May. The carrier had been on deployment 116 days, breaking the first *Yorktown*'s record (Reynolds 1986:125, 134).

Yorktown and the Task Force departed to invade the Marianas 6 June 1944. *Yorktown*'s primary targets were facilities on Guam. Attacks were scheduled for 16-18 June but intelligence suggested a Japanese carrier fleet was attempting to intervene, limiting initial air strikes to one day (Reynolds 1986:143). The carrier forces closed with the Japanese fleet, despite concerns about the amphibious forces' vulnerability. Early on 19, June *Yorktown*'s fighters were among those that engaged first Japanese air forces from Guam, then an attack group from the Japanese carriers (Reynolds 1986:149). The first Japanese naval air force attack was intercepted at 1034. The engagement was disastrous for the Japanese. A second wave was engaged at 1139 with equally lopsided results. The third attack wave was intercepted at 1303 and fared no better (Reynolds 1986:153-154).

The air engagement of 19 June 1944 was the largest in military history, and resulted in crippling losses to Japanese naval air power. Reports indicated as many as 400 Japanese aircraft were shot down during the air battle, with minimal American losses (Reynolds 1986:155). During the air attack, American submarines located the Japanese fleet and sank two carriers. Following the submarine strike, the Americans lost contact with the Japanese fleet. The fleet was again located late in the afternoon of 20 June. Despite limited daylight, Mitscher ordered an air attack on the remaining Japanese ships (Reynolds 1986:158). *Yorktown*'s aircraft made contact at 1840, and its dive-bombers crippled *Zuikaku* and hit another carrier (*Junyo* or *Hiyo*)

(Reynolds 1986:159). The aircraft were forced to attempt landings in darkness, a difficult operation during World War II irrespective of training.

Aboard *Lexington* (as discussed in the case study chapter), Mitscher made the famous decision to disregard Navy procedure and order every searchlight turned on (Reynolds 1986:164). This decision mitigated the nighttime aircraft recovery losses. Landings were haphazard, and planes landed on the first available carrier. Squadrons were scattered throughout the fleet, and many pilots were forced to ditch in the water (Reynolds 1986:164-167). *Yorktown* and other carriers were spared further attacks on the Japanese fleet; it had broken contact and retreated during the night of 19-20 June. A pilot in *Yorktown*'s VF-1 fighter squadron tallied the squadron's losses at 20 percent (Reynolds 1986:168).

By 23 June, *Yorktown* resumed air strikes on Japanese island facilities within range of the Marianas. Despite intermittent air attacks on the carrier forces, the invasion continued. After air operations on 28 July, *Yorktown* was ordered to Bremerton for overhaul, arriving on 17 August. While in drydock, the carrier received additional anti-aircraft guns. The documentary crew departed and returned to Twentieth Century Fox's Hollywood studio to finish the film documentary, titled "The Fighting Lady." The documentary's title was adopted as *Yorktown*'s nickname (Reynolds 1986:182).

Yorktown returned to the Fast Carrier Task Force in the Philippines in November 1944, after the Palau and Leyte landings and the naval battles of Leyte Gulf, 23-26 October. The Fast Carrier Task Force's principal objective was supporting the invasion. *Yorktown* performed admirably, sinking several destroyers and transports in Ormoc Bay on 11 November (Reynolds 1986:189). During November, *Yorktown* first encountered kamikaze attacks, which were beginning to plague the carrier forces. Several nearby carriers were hit by bombs and aircraft,

but *Yorktown* was spared (Reynolds 1986:193). The Task Force continued to attack targets in the Philippines as amphibious forces fought northward. The carriers were forced to abandon their attacks in mid-December to ride out the infamous December 1944 typhoon, which sank several smaller vessels (Blee 2005:119). The Task Force returned in sufficient time to support the 9 January 1945 Luzon landings.

With the landing areas secure and local air superiority, *Yorktown* and the Task Force moved east into the South China Sea. The Navy was searching for remaining Japanese battleships in addition to neutralizing land-based air assets. Between 10-20 January, the Fast Carrier Task Force attacked targets in occupied China and French Indo-China. The carrier group located no Japanese capital ships in the region, but *Yorktown*'s aircraft crippled the captured French cruiser *LaMotte-Picquet* on 12 January (Reynolds 1986:214-215). Leaving the South China Sea, the carriers swept northward, attacking Formosa and Okinawa. After retiring to take on supplies, the Task Force approached Iwo Jima for preliminary air strikes.

Proximity to the Japanese home islands prevented *Yorktown* and the other carriers from remaining on station at length. After initial strikes on home island airfields, *Yorktown*'s air attacks were redirected at Iwo Jima. The landings began 19 February; by 14 March, the island was sufficiently secure to allow the Task Force to return to attacking Home Island bases (Reynolds 1986:247). On 18 March a Judy dive-bomber evaded anti-aircraft fire and hit *Yorktown* immediately after the ship had maneuvered for a pilot's crash landing (Reynolds 1986:252). The ordnance penetrated the flight deck, but ricocheted and exploded away from the hull. The explosion caused numerous casualties and destroyed several smaller anti-aircraft batteries, but did not cause any significant structural damage (Reynolds 1986:252). The bomb's

impact was the carrier's only combat damage, and 18 March (Palm Sunday) became colloquially known on board *Yorktown* as "Bomb Sunday" (Reynolds 1986:248).

Yorktown spent the remainder of March attacking Okinawa and the Home Islands. The attacks preceded the 1 April Okinawa invasion. Its aircraft supported the landings until American intelligence confirmed that a Japanese naval force led by the battleship *Yamato* was on an apparent suicide mission (Reynolds 1986:272-273). On 7 April bombers from several carriers including *Yorktown* attacked the Japanese surface force. *Yorktown*'s aircraft torpedoed *Yamato*, delivered lethal bomb hits to the light cruiser *Yahagi*, and sank the destroyer *Isokaze* with torpedoes (Reynolds 1986:274-275).

With the final major Japanese naval threat eliminated, the Task Force resumed attacking Okinawa, while defending against constant conventional and kamikaze attacks by land-based aircraft. *Yorktown*'s fighters assisted in defending *Laffey*'s picket station against intense kamikaze attacks on 16 April (Reynolds 1986:287). Japanese aircraft continued to attack American carriers off Okinawa, but *Yorktown*'s aircraft and antiaircraft guns prevented enemy aircraft from damaging the ship. The Fast Carrier Task Force finally withdrew from combat on 12 May. Following a brief rear-area stay, *Yorktown* and the Task Force returned to Okinawa and through mid-June attacked targets on Okinawa and the Home Islands. *Yorktown* retired to Letye before returning in early July to participate in the final series of air strikes on Japan. The strikes destroyed remnants of the Japanese Navy in its Yokosuka port on 23 July (Reynolds 1986:308).

The air offensive against the Japanese home islands were supposed to precede an anticipated invasion. *Yorktown* had withdrawn from its station to refuel when, on 15 August, news of Japan's intention to surrender arrived. The carrier was still preparing aircraft for attacks on Tokyo when the news was confirmed (Reynolds 1986:318). The announcement did not

prevent several Japanese aircraft from attacking the carrier force that morning (Reynolds 1986:320). As combat ceased and peace negotiations began, *Yorktown*'s aircraft were pressed into relief service. On 25 August the carrier's planes began airdropping supplies to POW camps (Reynolds 1986:324). Its aircraft were also assigned to fly support missions for disembarked occupation forces. *Yorktown* remained in Japanese waters until 1 October. The carrier arrived in San Francisco 20 October 1945 (Reynolds 1986:331). Post-war demobilizations included *Yorktown*, and the carrier was prepared for placement in reserve ("mothballed") and decommissioned 9 January 1947 (Reynolds 1986:334).

The Korean conflict and emerging Cold War prompted the Navy to reactivate *Yorktown*. The carrier was overhauled and recommissioned in January 1953, but was not available for war service before the cessation of hostilities (Terzibaschitsch 1980:150). Most *Essex*-class aircraft carriers were extensively modified during post-war modernization programs. Rapid evolution in naval air technology and doctrine prompted the Ship Characteristics Board (SCB) to authorize these programs (Terzibaschitsch 1980:9, 144-146). *Yorktown* underwent SCB-27A in 1951-1953 as part of its decommissioning. This program included upgrades to hydraulic catapults, removal of 5" turrets, and installation of a pilot escalator connecting the flight and hangar decks (Terzibaschitsch 1980:144). In 1954-1955 the carrier underwent SCB-125. The most significant features of this program included the enclosed "hurricane" bow and the angled flight deck (Terzibaschitsch 1980:145).

Yorktown served with the 7th Fleet in the Far East prior to the SCB-125 refit, and following the overhaul, it continued to operate as a fleet aircraft carrier until September 1957 (Terzibaschitsch 1980:150). By the late 1950s, *Essex*-class carriers lacked the space and catapult power necessary to operate newer, larger, and heavier Navy aircraft. Most *Essex*-class carriers

were reassigned as anti-submarine platforms (Terzibaschitsch 1980:143). As an anti-submarine carrier (classification CVS-10), *Yorktown* returned to Pacific service. The carrier served in the Vietnam conflict in 1967 and 1968.

In July 1968, *Yorktown* returned to the American Pacific Coast to perform two final duties. It was used to film scenes for the movie *Tora! Tora! Tora!*, masquerading as a Japanese carrier (David Clark 2009, pers. comm.). In December 1968, *Yorktown* operated as a recovery ship for the Apollo 8 space crew. The ship was finally decommissioned in Philadelphia 27 June 1970, and struck 1 June 1973. In 1974, the Navy approved *Yorktown*'s donation to the Patriots Point Development Authority, and the vessel opened as the museum's sole vessel in 1975.

The USS *Laffey* (DD-724) is an *Allen M. Sumner*-class destroyer, one of 58 class vessels built during the Second World War. The class design was proposed in October 1941 and finalized in early 1942, allowing the Navy's Bureau of Ships to benefit from initial wartime experience (Conway 1980:132-133). Vessel DD-724 was named for the previous *Laffey*, a *Benson*-class destroyer sunk 13 November 1942 during the Naval Battle of Guadalcanal (Becton 1980:1-2). Constructed at the Bath Iron Works in Bath, Maine, the ship was commissioned on 8 February 1944 (Becton 1980:59). The *Laffey* was not immediately dispatched to the Pacific Theater; it was posted to England for shore bombardment supporting the Normandy landings.

The destroyer was assigned to the Escort and Reserve Fire Support Group for the Utah Beach landings (Becton 1980:95). *Laffey* escorted landing craft toward the beach, and then took a position to screen the bombarding ships from potential threats, including German torpedo boats. German naval forces were unable to muster resistance in the Utah Beach area due to weather and sea conditions (Becton 1980:112). *Laffey* remained on station off Utah Beach through 20 June, providing artillery support at the request of 4th Infantry Division soldiers. With

the landing areas secure, the destroyer was one of several vessels ordered to support attacks on Cherbourg. The bombardment group fired on Cherbourg's defenses on 25 June. During the bombardment *Laffey* received its first damage. A German shell penetrated the hull and lodged in a port bow compartment without exploding (Becton 1980:132-133).

Following bombardment of Cherbourg's fortifications, *Laffey* was ordered to the U.S. Atlantic coast. After spending a month in Boston, the destroyer began testing of its radar system. It left Norfolk for Pearl Harbor via the Panama Canal, arriving in September (Becton 1980:146-147). Following more training, *Laffey* departed to join the Third fleet, accompanying several other warships including the battleship *North Carolina* (Becton 1980:148). The destroyer moved closer to front-line operations, one forward base at a time. When *Laffey* reached Ulithi in early November 1944, it was assigned to Task Force 38.4, part of the Fast Carrier Task Force. U.S. forces in the Central Pacific Theater had landed at Leyte in the Philippines in October, and *Laffey* was assigned to provide antiaircraft defense for the aircraft carriers. It engaged in active combat on 11 November and captured a downed Japanese pilot the same day (Becton 1980:155).

Laffey spent the next two months as part of the 7th Fleet, directly supporting further amphibious assaults in the Philippines. The destroyers covered the 77th Infantry Division's landing at Ormoc Bay on 7 December, an offensive to outflank and dislodge Japanese defensive positions on Leyte Island. Kamikaze aircraft sank two other destroyers of the supporting naval force, including the *Ward* of Pearl Harbor notoriety (Becton 1980:168). On 15 December, *Laffey* was among naval forces assigned to support the capture of Mindoro and its valuable airfields. The landing did not encounter significant enemy resistance. With staging areas secure, the Allies were able to prepare for invading Luzon and the liberation of Manila from Japanese occupation. Through the first week of January 1945, *Laffey*'s destroyer squadron escorted the bombardment

force, consisting primarily of older American battleships. The naval force endured kamikaze attacks throughout the campaign, but despite the loss of several vessels (including an escort carrier), the attacks failed to prevent the 9 January landings. Throughout the Philippines campaign, *Laffey* avoided significant damage.

Laffey was reassigned to Task Force 58 (the Fast Carrier Task Force). To defend against the intense Japanese air attacks against the Iwo Jima amphibious assault, the Task Force was ordered to attack airfields on the island and on the Japanese Home Island of Honshu (Becton 1980:202). The Task Force attacked Japan on 16 and 17 February before relocating to attack Iwo Jima, though other American naval and air assets had been conducting attacks for weeks prior to the 19 February landings. *Laffey*'s assignment off Iwo Jima was cut short on 28 February by orders to deliver crucial photographic intelligence to Adm. Chester Nimitz's headquarters on Guam (Becton 1980:212). *Laffey* returned to front-line duty in late March to participate in the Okinawa invasion. *Laffey* was assigned as part of the screening force that protected older battleships. Initial kamikaze attacks targeted the Fast Carrier Task Force. By 26 March, the Japanese were redirecting their aircraft to attack the bombardment force. The days leading up to the 1 April invasion included sporadic but fierce attacks on the screening destroyers (Becton 1980:220). The Japanese Navy also dispatched a force centered around the battleship *Yamato* on a mission to cause as much destruction to the invasion force as possible. American air superiority eliminated the suicide force well before it came into surface contact with any American vessels (Conway 1980:178).

Laffey was on station off Okinawa from 24 March through 17 April, and Japanese air attacks were frequent throughout this period. The most noteworthy combat service in the ship's history occurred on 16 April. On 14 April, *Laffey* was reassigned to Radar Picket Station 1, 30

miles north of Okinawa (Becton 1980:233). This position was the extreme edge of the American formation. Approximately 50 planes attacked *Laffey* beginning at 0829 (Becton 1980:237). Over the next two hours, 22 Japanese aircraft attacked *Laffey*. According to *Laffey*'s commanding officer, Cmdr. F. Julian Becton, the ship received seven direct hits by kamikaze aircraft, three direct bomb hits, and multiple near hits (Becton 1980:241-256). The damage was most severe to the aft 5" main battery turret (Mount 53) and the rudder and rudder control mechanisms. As the attack progressed, American fighter aircraft were directed to intercept the incoming aircraft, allowing *Laffey* to conduct sufficient damage control to continue operations. Casualty rates were high. *Laffey*'s normal complement was 336; the attacks of 16 April left 32 dead and 71 wounded (Conway 1980:132; Becton 1980:260). For its actions, *Laffey* was awarded the Presidential Unit Citation.

Laffey was towed rearward, first by a minesweeper, then by dedicated tugs. After spending 17-22 April directly off Okinawa conducting emergency repairs, the battered destroyer made a series of repair stops at Saipan and Pearl Harbor before arriving in Seattle on 24 May for more thorough repairs. The repairs kept *Laffey* in port until 6 September, four days after the Japanese surrender.

The destroyer participated in Operation Crossroads, collecting scientific data from the Bikini Atoll atomic bomb tests. The ship was decommissioned in June 1947 and added to the Pacific Reserve Fleet. Called back into action, the ship was recommissioned for Korean War service on 26 January 1951. *Laffey*'s primary role in the Korean conflict was shore bombardment, most notably the shelling of Wonsan Harbor coastal fortifications (Becton 1980:274).

Following Korean War service, *Laffey* operated with various naval groups in the Atlantic and Mediterranean. It was part of 6th Fleet patrolling the northern Sinai coastline during the Suez Crisis in 1956. The destroyer continued to operate in the Persian Gulf and in NATO exercises until undergoing modification during the Fleet Rehabilitation and Modernization II (FRAM II) program in 1962 (David Clark 2009, pers. comm.). *Laffey* continued to operate with anti-submarine formations in the Atlantic and Mediterranean theaters until it was decommissioned in March 1975. Upon donation to Patriots Point in 1981, it was the only surviving *Allen M. Sumner*-class destroyer in the U.S. (Conway 1980:132). *Laffey* has been moved twice since becoming a museum ship. The first move occurred following transfer of NS *Savannah* to facilitate easier access from the pier. The second move saw the ship towed to drydock to conduct the hull repairs detailed below.

USS *Clamagore* (SS-343) was built at the Electric Boat Co. in Groton, Connecticut, and commissioned 28 June 1945 (Conway 1980:146). The need for additional submarines in the Pacific had waned, and *Clamagore* remained in the Atlantic for its brief wartime service (Roberts and Jones 1991:74). After the war, the submarine operated in the Caribbean until it entered Philadelphia Naval Shipyard for modernization in 1947. Wartime submarine experience led the Navy to undertake several submarine upgrade projects, including the Greater Underwater Propulsion Power program (GUPPY) for increased power capacity and improved hydrodynamics (Alden 1979:131).

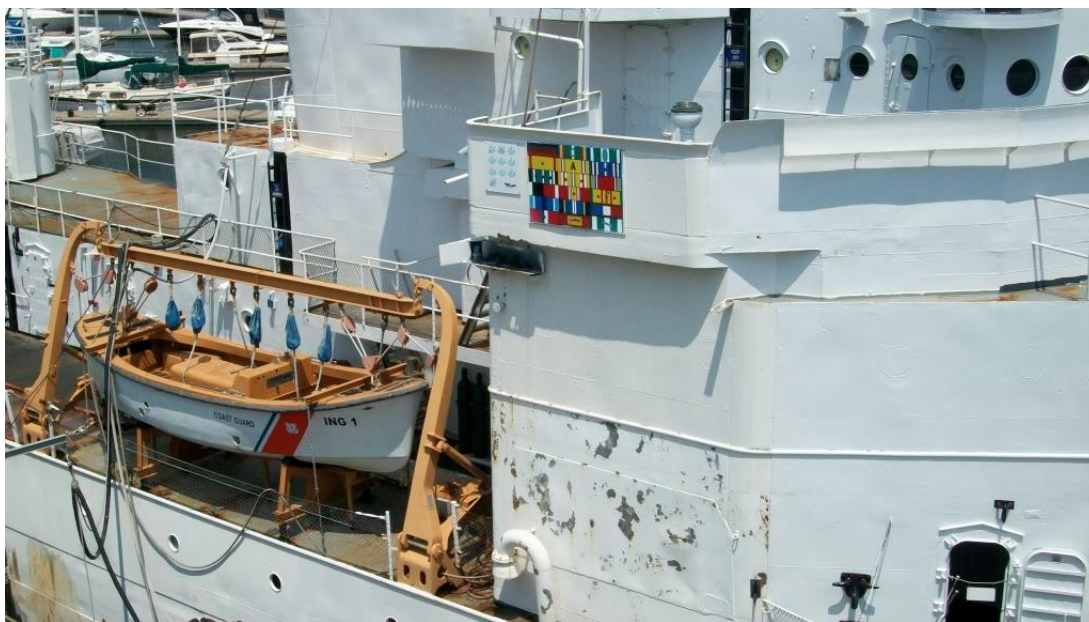
GUPPY I was applied to two submarines to test submarine detection capabilities (Alden 1979:131). GUPPY II was the first major overhaul of submarines intended for fleet service. *Clamagore* received this upgrade and returned to active duty in 1948 (Alden 1979:184). The submarine resumed operations in the Caribbean, though it was briefly reassigned to the

Mediterranean from February to April 1953. *Clamagore* was selected to participate in NATO exercises during 1957-1958. The ship operated out of Charleston, South Carolina, until 1962, alternating between Atlantic coastal and Mediterranean deployments.

In 1962, *Clamagore* was again slated for modernization. The GUPPY III program was authorized to extend the service life of nine GUPPY II submarines (Alden 1979:184). Modern electronics and crew space dictated a 15-foot hull extension, installed immediately before the control room and conning tower (Alden 1979:184-185). The conversion was completed in February 1963, but further GUPPY III modifications were not implemented until 1968. (Alden 1979:185). *Clamagore* returned to Caribbean service, but was frequently detached to conduct NATO operations in the North Atlantic. Diesel submarines became obsolete, and *Clamagore* was decommissioned 12 June 1975 (Conway 1980:146). It was originally scheduled for transfer to Turkey, as numerous older American submarines were transferred to allied foreign navies after becoming outdated for U.S. Navy operations. Transfers to Turkey were discontinued following the 1974 invasion of Cyprus (Alden 1979:191). *Clamagore* remained in reserve until the Navy donated the submarine to Patriots Point in 1981. The ship is the only surviving example of a GUPPY III conversion (David Clark 2009, pers. comm.)

The USCGC *Ingham* (WHEC-35) was the oldest vessel maintained for public display by Patriots Point. The Treasury-class high-endurance cutter was built at the Philadelphia Navy Yard and commissioned 12 September 1936 (HNSA 2008:50). During World War II, *Ingham* initially operated as a convoy escort in the Atlantic. On 15 December 1942, *Ingham* sank *U-626* (Cressman 2000:136). The vessel was transferred to the Pacific in 1944 and participated in Philippine Islands amphibious operations, including landings at Mariveles, Iloilo, and Negros Island (Willoughby 1957:294).

Ingham's post-war service was lengthy, and included multiple upgrades and modernization efforts. The cutter performed its duties with the Coast Guard. During Vietnam, it was stationed off the Vietnamese coast to interdict military supplies to communist forces. Occasionally the cutter was required to provide shore support. *Ingham* returned to post-Vietnam Coast Guard duty on the U.S. Atlantic coast. The cutter was one of several Coast Guard vessels assigned to rescue Cuban refugees during the 1980 Mariel Boatlift. *Ingham* was decommissioned on 27 May 1988 and was donated to Patriots Point in 1989. At the time of the on-site research in June 2009, the Patriots Point Authority intended to transfer *Ingham* to another museum. The vessel was not suffering any major conservation problems, but the Authority needed to reduce the number of vessels administered by the Museum, a concern heightened by an urgent need for repairs to *Laffey* (David Clark 2009, pers. comm.). *Ingham* was transferred to the Miami Dade Historical Maritime Museum in October 2009, and was further donated to its own museum organization in Key West, Florida later that year.



Photograph 27: *Ingham*'s superstructure in June 2009, two months prior to its transfer.

NS *Savannah* was the first nuclear-powered merchant ship, and was operated by the Maritime Administration from 1962 to 1971 (Batio 2001:82-83). *Savannah* was intended as a prototype; in addition to operating as a bulk carrier, it included 30 passenger cabins (Batio 2001:82). Nuclear power was eventually determined to be less efficient than conventional oil-fueled engines. *Savannah* was decommissioned in 1971. Though owned by the Maritime Administration, it was loaned to the City of Savannah in anticipation of a floating hotel project (David Clark 2009, pers. comm.). When the project failed to materialize, *Savannah* was loaned to Patriots Point in 1981. The museum displayed the ship, allowing limited access to cargo and passenger spaces. The reactor spaces were visible from an observation room (David Clark 2009, pers. comm.). The loan arrangement and maintenance costs proved prohibitive for Patriots Point to continue displaying *Savannah*, and it was returned to the Maritime Administration in 1994. The ship is currently stored in Baltimore, awaiting a potential future museum organization.

USCGC *Comanche* (WPG-76) was commissioned 1 December 1934. It served in the Atlantic during World War II, its duties including convoy escort and weather patrol. *Comanche* was decommissioned 29 July 1947. It operated with the Virginia Pilots Association until 1984, when it was donated to Patriots Point. The cutter required significant maintenance and was never fully opened for public display. *Comanche* was heavily damaged during Hurricane Hugo and was sunk offshore as an artificial reef in 1990 (South Carolina 1990: H 4430).

The Patriots Point Development Authority originally selected the museum's location at the eastern shore of Charleston Harbor (near Mount Pleasant, South Carolina) due to its proximity to the city of Charleston, the Charleston Navy Yard, and the potential for an adjacent commercial development (David Clark 2009, pers. comm.). The museum opened *Yorktown* on 3 January 1976. The Authority sought to expand the museum, and acquired *Laffey*, *Clamagore*,

and *Savannah* in 1981. The museum acquired *Comanche* in 1984 and *Ingham* in 1989. In 1989-1990, the museum administered six vessels with five on public display. This resulted from haphazard leadership by Executive Directors and Authority Board members (David Clark 2009, pers. comm.). The Authority added ships, but did not appropriately increase the museum's personnel (David Clark 2009, pers. comm.). By 1995, the museum reduced its complement to four vessels. In 2008, the corrosion damage to *Laffey*'s hull placed additional financial difficulties on the Museum, prompting the Authority to consider transferring *Ingham* (David Clark 2009, pers. comm.). With *Ingham* transferred and *Laffey* berthed off-site, Patriots Point currently has two ships on display – *Yorktown* and *Clamagore* (Photographs 28, 29, 30).

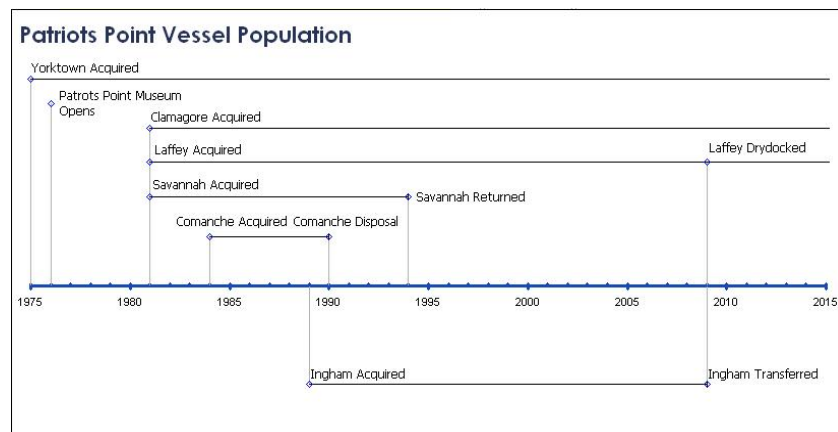


Figure 17: Timeline of Museum Vessels Administered by Patriots Point



Photograph 28: *Laffey* and *Ingham* in June 2009, viewed from the aft edge of *Yorktown*'s flight deck. *Savannah* was moored in *Laffey*'s location between 1981 and 1994.



Photograph 29: Bow-on view of *Clamagore* from entrance causeway, 2009. *Yorktown*'s entrance is visible at right.



Photograph 30: Bow-on view of *Clamagore* from entrance causeway, 2011. *Laffey* was originally moored starboard of *Clamagore*.

Though most museum facilities are located aboard *Yorktown*, the museum's terrestrial facilities house admission, gift shop, and some maintenance operations. The replicated Vietnam-era ATSB is located adjacent to the terrestrial facilities. The museum vessels are accessed via a concrete pier extending into Charleston Harbor (Photograph 31). The pier is connected to the

Charleston Harbor Resort and Marina (Photograph 32), one of several adjacent commercial developments leasing land from the Development Authority (David Clark 2009, pers. comm.). *Yorktown* and *Clamagore* remain in the positions originally arranged when towed to the museum site. Both vessels rest in mud for stability; the bottom of *Yorktown*'s hull sits in 27 feet of mud (David Clark 2009, pers. comm.). *Clamagore*'s berth has shifted beneath the hull, giving the vessel a slight list to port. Previous vessels also settled in mud, though *Comanche*'s small size and frequent relocation hindered efforts to establish a permanent and stable display location (David Clark 2009, pers. comm.). Disability access is available to *Yorktown*'s hangar deck; the museum intends to install an elevator system permitting similar access to the flight deck (David Clark 2009, pers. comm.). The aircraft displayed on *Yorktown*'s hangar and flight decks are on loan from the Navy. The loan agreement tasks the museum with responsibility for aircraft maintenance; the museum issues regular reports to the Navy detailing their condition, similar to the Inactive Ships Inspection Program requirements for museum vessels (David Clark 2009, pers. comm.).



Photograph 31: *Yorktown* and causeway, viewed from museum entrance.



Photograph 32: Patriots Point's Marina, viewed from *Yorktown*'s stern.

The museum operates with a non-specific mission. Patriots Point's vessels span several periods of twentieth century American naval history and require broad methods of interpretation, exhibition, curatorial and collection policies (Eleanor Wimett 2009, pers. comm.). The museum's vision has been severely hampered by previous museum directors. Limited availability of professional support for operations meant that hiring decisions were products of less-than-rigorous standards. The Development Authority historically hired former high-ranking military officers, likely on the assumption that a general or admiral was qualified by virtue of former commands to direct a warship museum (David Clark 2009, pers. comm.). This proved to be problematic; the former officers did not understand museum practices, had poor relations with museum personnel, and one was terminated for embezzlement (David Clark 2009, pers. comm.). *Yorktown* also served as a Civil Defense shelter during the 1980s. The museum is burdened with a stockpile of supplies and expired medicine that cannot be disposed of without significant cost (Photograph 33). The Development Authority hired Director of Tourism and Business

Development Dick Trammell as interim director in April 2009, a marked departure from previous hiring practices (David Clark 2009, pers. comm.). In November 2010, former Mount Pleasant town administrator Mac Burdette was hired to replace Trammell, who announced his intentions to step down as executive director by the end of 2010 (Charleston Regional Business Journal 2010). Though Burdette is a retired Army officer, his military credentials were not a significant consideration in his hiring. Burdette is the third person to serve as Executive Director in less than two years.



Photograph 33: Lockers aboard *Yorktown* containing Civil Defense emergency supplies.

Despite the tumultuous Executive Director position, museum personnel have added organizational stability and sought to improve professional operations. The primary curatorial and collections functions are handled by the Curator of Collections (Eleanor Wimett 2009, pers. comm.). Responsibility for exhibition spaces was merged with the overall museum operations

under the Senior Curator and Director of Exhibitions in 2001 (David Clark 2009, pers. comm.). To avoid disputes regarding loaned material, the museum collections policy explicitly states that the museum may only accept loans from federal agencies (Patriots Point 2009a).

Yorktown houses most museum personnel offices, meeting spaces, and collections (artifact, document, and exhibit storage) spaces. The machine shop is still actively used for maintenance (Joe Whitlock 2009, pers. comm.). Offices and collections spaces have been modified for climate control. Installation of HVAC, electrical, and plumbing equipment required cutting access points through bulkheads on board *Yorktown*. Updated HVAC and plumbing infrastructure have also been installed for the forward berthing spaces used in overnight events, and in the museum's artifact storage spaces (Photographs 34, 35). The modifications have affected the museum's ability to interpret some spaces; a sewer line running through Third Deck cuts through the warrant officer's lounge and presents a major impediment to any future restoration (David Clark 2009, pers. comm.). No tour spaces are air-conditioned, a common visitor complaint. The maintenance staff has maintained the ship's ventilation system, allowing airflow within the interior compartments (Joe Whitlock 2009, pers. comm.). Use of the ship's ventilation systems also contributes ambient sound, heightening the auditory immersion for visitors touring the ship's interior. The Authority has considered extending the HVAC network to some artifact spaces, but limited funding has given this a low priority (David Clark 2009, pers. comm.).



Photograph 34: *Yorktown's* art and framed photograph storage space.



Photograph 35: *Yorktown's* model storage space.

The maintenance staff maintains lines of communication throughout the facility using two-way radios. The radios exhibit difficulty transmitting and receiving in *Yorktown's* lower spaces. The staff restored operability to the sound-operated telephone system connected to the engine room, allowing employees and docents to communicate with museum facilities in the event of an emergency (Joe Whitlock 2009, pers. comm.). The museum staff has also considered

audio speakers with sub-woofers to transmit diesel engine sounds into *Laffey* and *Clamagore* to add sound to their interpretations.



Photograph 36: Ladder on Tour Route 2, descending to one of *Yorktown*'s engine rooms. This ladder was installed by the museum to make visitor access easier.

Numerous spaces are closed off to prevent vandalism or excessive wear. Theft has proven a nuisance for the museum, particularly with weapon-related artifacts and exhibits. To minimize theft and vandalism, the museum utilizes video surveillance in spaces with valuable or large numbers of artifacts (David Clark 2009, pers. comm.). The museum also installed Plexiglas in certain spaces. Most spaces aboard *Clamagore* are behind Plexiglas, to prevent artifact theft and facilitate visitor safety in confined quarters. Plexiglas was also installed in *Yorktown*'s World War II-era ready room, the combat information center (CIC), and the captain's bridge in the early 1980's to limit deterioration (Photographs 37, 38). This practice

proved unpopular, and by 2000 the Plexiglas had been removed (David Clark 2009, pers. comm.).



Photograph 37: A Gallery Deck ready room restored to its Second World War appearance. The chairs were cordoned off behind Plexiglas during the 1990s. Several spaces on *Yorktown* were modified in this manner, but the measures proved unpopular.



Photograph 38: This aviation crew berthing compartment, located on *Yorktown*'s Second Deck, is restored to 1960's appearance. It retains its Plexiglas barrier.

When *Yorktown* opened for public display, the museum operated one tour route through the vessel. This route comprised portions of current Tour Routes 1 and 4 (David Clark 2009,

pers. comm.). The engine room was first opened to the public in 1982 following asbestos abatement procedures (David Clark 2009, pers. comm.). In 1984, the museum adopted the idea of multiple tour routes following lengthy discussions with staff at Battleship USS *Alabama* (David Clark 2009, pers. comm.). Initial tour routes predominantly went through of unmodified spaces and compartments containing exhibits for other ships. Veterans' groups were encouraged to design exhibits for their respective aircraft carriers (Photograph 39). The groups had no museum experience, and quality control in these exhibits was nonexistent (David Clark 2009, pers. comm.). As the museum refined its practices on board *Yorktown*, these exhibits were removed or moved to other locations to allow interpretation of living and working spaces (David Clark 2009, pers. comm.). An example of this was the "Women in the Military Exhibit", which has been temporarily placed in storage to allow restoration of *Yorktown*'s original chapel (Photograph 40). The ship-specific exhibits have been largely isolated and limited to Tour Route 4. An exception is the *Essex* exhibit, which is located on Tour 3 (Photograph 41).



Photograph 39: USS *Enterprise* exhibit on Tour Route 4. This is one of the earliest exhibits still in use. The lacquered material mounted on wood is fading rapidly, and the entire set of display pieces may require disposal.

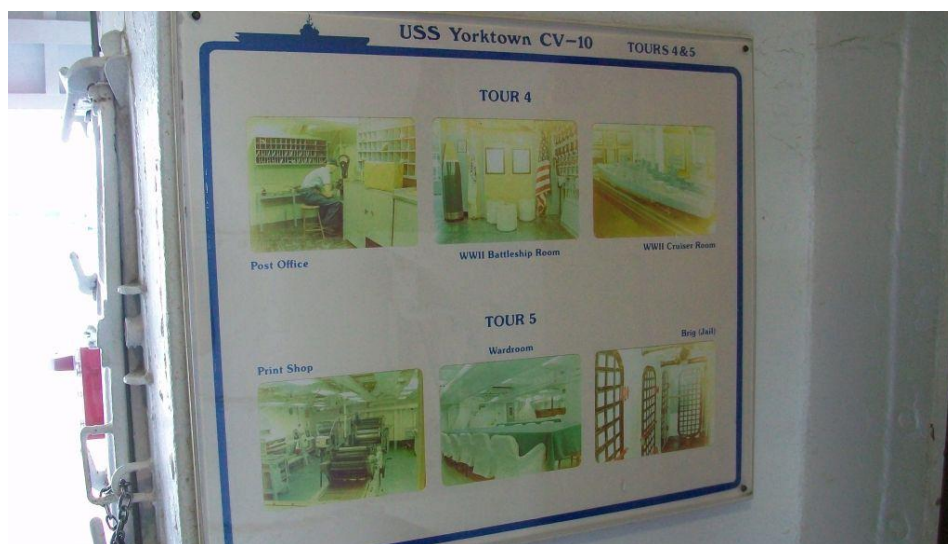


Photograph 40: This compartment was originally the ship's chapel. The museum originally modified the space to facilitate exhibits, most recently an exhibit on women in the military. Restoration of the chapel began in 2011.



Photograph 41: A ship-specific exhibit modernized and renovated. The Essex's display has been relocated to a port quarterdeck compartment as part of Tour Route 3.

The museum currently operates six tour routes on board *Yorktown*. All tours begin and end on the hangar deck, which is divided by compartment bulkheads into three sections. The museum's older aircraft (World War II, Korean War, and other piston-engine aircraft) and space capsules are displayed in Sections 1 and 2. Section 1 also houses the ship's movie theater. Section 3 houses the Medal of Honor Museum, event stage, and snack bar. The Medal of Honor Museum, constructed as a terrestrial museum facility, details the medal's history and recipients (David Clark 2009, pers. comm.).



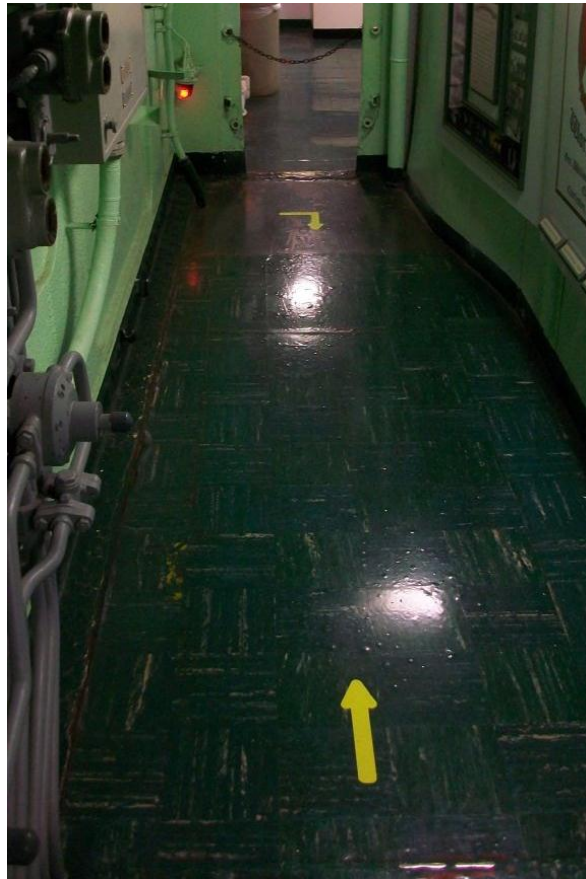
Photograph 42: Tour Route signage aboard *Yorktown*.



Photograph 43: Signage aboard *Yorktown* intended to clarify wayfinding.



Photograph 44: Most of *Yorktown*'s wayfinding arrows are small, and some need replacing.



Photograph 45: On occasion, *Yorktown*'s wayfinding arrows are confusing and contradictory.

Tour 1 consists of representative crew living and working spaces. The first space on Tour 1 is the chief petty officer's galley, which has been renovated to function as a public dining facility (Photograph 46). Tour 2 includes the fire and engine rooms. Tour 3 covers the flight deck and bridge. Patriots Point's modern aircraft and helicopters (aircraft less susceptible to environmental deterioration) are exhibited on the flight deck. Tour 4 accommodates the ship-specific exhibits, as well as ship and aircraft model displays. Tour 5 includes the wardroom and brig. Tour 6 originally included the forecastle, but the spaces were appropriated for accommodating overnight camping groups. The tour now includes spaces before the theater and contain exhibits dedicated to the Charleston Navy Shipyard. The shipyard was closed in 1996 as part of the post-Cold War Base Re-alignment and Closure (BRAC) program (David Clark 2009, pers. comm.).



Photograph 46: *Yorktown's* Petty Officer's Galley, located on Second Deck, is now used as a lunch cafeteria by the museum.

The smaller ships have proven less difficult to create tour routes for. *Laffey's* single tour route was included the external main deck, a 5" gun turret, bridge, mess hall, and combat

information center. A berthing compartment was modified to accommodate exhibit space (David Clark 2009, pers. comm.). The museum replaced *Clamagore*'s forward hatch with a stairway for visitors' safety (Photograph 47). *Clamagore*'s tour route proceeds fore to aft along the main deck; the lower engineering and crew spaces and upper conning tower are visible through Plexiglas, but are off-limits to visitors for safety reasons. *Ingham*'s tour route descended from the aft deck and traversed through the engine room and main deck, and exited the vessel immediately abaft the bridge. A rectangular box, colloquially referred to as the "outhouse," was added to the deck (Photograph 48) to allow visitor access while keeping rainwater out of internal spaces (David Clark 2009, pers. comm.). *Ingham*'s spaces were modernized in the 1970's and 80's, including installation of HVAC infrastructure (David Clark 2009, pers. comm.). This allowed artifacts to be displayed throughout the cutter. Most spaces on the tour route were visible only through hatches covered with Plexiglas, limiting interaction.



Photograph 47: Modified entrance to *Clamagore*.



Photograph 48: *Ingham's* "outhouse".

Patriots Point ships' lengthy service makes period-specific interpretation difficult. Some World War II-era spaces important for interpretation no longer existed and had to be recreated, such as the Torpedo Maintenance Room. *Yorktown* contained furniture and fixtures present when decommissioned in 1975. The 1960s-era equipment has been replaced in spaces specifically remodeled to World War II-era configuration (David Clark 2009, pers. comm.). In spaces with no time-specific or Vietnam-era interpretations, the staff has left fixtures intact.



Photograph 49: Operating Room aboard *Yorktown*, restored to circa 1960's appearance. The large photograph reinforces the interpretation by depicting the space in active use.

The curatorial staff acknowledges that the museum originally lacked a professional approach to exhibit design. The staff has attempted to improve exhibit quality, including efforts to modify third-party-created ship exhibits (David Clark 2009, pers. comm.). The Doolittle Raid exhibit is used as a benchmark for creating new and improving existing exhibits (David Clark 2009, pers. comm.). The staff has also broadened the historical scope of the exhibits and included exhibits highlighting Navy service of women and black Americans (Joe Whitlock 2009; Melissa Buchanan, 2011; pers. comm.). The Black Americans in the U.S. Navy exhibit, designed by professional museum staff, stands in stark contrast to the older Amphibious Assault Ship exhibit (Photographs 50, 51). Not every exhibit has been altered or improved. The Mine Warfare Exhibit, originally part of Tour 4, was typical of early non-professional exhibits. Instead of clearing the space or relocating the exhibits and artifacts, the staff walled off the space

with removable panels and re-routed the tour. The staff intends to create or conduct major upgrades of one or two exhibits per year (David Clark 2009, pers. comm.). This policy and the alteration of tour routes are intended to shorten tour lengths, allowing visitors to see as much of the museum as possible in a limited amount of time (David Clark 2009, pers. comm.).



Photograph 50: The Amphibious Warfare Exhibit, located on Tour Route 1, is representative of exhibits assembled by third-party veteran organizations.



Photograph 51: Detail of the Amphibious Warfare Exhibit. The applique letters are becoming worn and discolored.

The museum is rapidly moving forward with new electronic exhibits intended to increase interactivity. The prototype exhibit utilizes a touchscreen computer connected to various databases (Darin Reed 2011, pers. comm.). The Lost Submarines of World War II exhibit aboard *Clamagore* occupies the submarine's only space modified for museum exhibition. The exhibit consists of large plaques containing the names of crewmen lost aboard each submarine. This exhibit will be modified to include a computer terminal in fall 2011 (Tom Sprowl 2011, pers. comm.). Another exhibit utilizing computer technology is being developed for a Second World War naval aviator database (Photograph 52). The terminals are currently self-contained, but long-term plans include an integrated database facilitating multiple exhibits (Darin Reed 2011, pers. comm.). Technological assistance is not always cutting-edge; the combat information center and air traffic control spaces utilize Second-World-War-era radio traffic recorded on board the aircraft carrier *Hancock* (Melissa Buchanan 2009, pers. comm.). The museum also intends to add more push-button-for-sound displays (Tom Sprowl 2011, pers. comm.). The museum is also researching methods of dispensing manufactured smells, such as the smell of baked cookies in the bakery (Darin Reed 2009, pers. comm.).



Photograph 52: Computer terminal in *Yorktown*'s hangar deck. This terminal allows visitors to search a database of Second World War Naval Aviators.

The museum originally relied heavily on veterans and reunion groups for attendance and interpretation (David Clark 2009, pers. comm.). Veterans groups' reunions constitute the majority of attendance and special events. Reunions are most frequently scheduled in the fall from after Labor Day Weekend through mid-November (Melissa Buchanan 2011, pers. comm.). As the veteran population diminished, the museum began to improve its capabilities in exhibition, interpretation, and other forms of visitor interaction. Veterans are still crucial to interpretation, however; in 2011, the museum began collecting oral histories of over 150 surviving crew (Melissa Buchanan 2009, pers. comm.). The museum has recognized fundamental changes in visitor demographics. Museum attendance was averaging 300,000 regular visitors (overnight groups and event attendees excepted) per year by 2009 (David Clark 2009, pers. comm.). Museum staff noted a significant increase in visitor traffic since 2001. The staff also noted significant ethnic trends among visitors; half of Patriots Point's visitors in December are Japanese (David Clark 2009, pers. comm.).

Patriots Point has placed increased emphasis on living history presentations for both World War II and Vietnam eras. Living history programs were conducted on board *Laffey* prior to the ship's closure (David Clark 2009, pers. comm.). "Living Exhibits" consisting of 5 or 6 volunteers utilize the Support Base. The events have drawn increased attention to the museum, and have not required significant material investment as reenactors supply their own personal gear (David Clark 2009, pers. comm.). Patriots Point also conducts programs with civil and military organizations. Area fire and rescue services and the Naval Nuclear Power Training Command are regularly invited to conduct meetings on board *Yorktown* (David Clark 2009, pers. comm.). Museum staff also examined the success of Battleship *North Carolina*'s "Behind the

Scenes” tour program. They hope to implement similar tours in the future (David Clark 2009, pers. comm.). The staff strongly expressed the desire not to become involved in ghost-related tours or ghost-hunting media programs (David Clark 2009, pers. comm.).

Patriots Point’s maintenance department faces equally significant challenges. Administering multiple vessels compounds the difficulties of single-vessel museums. The maintenance staff’s most frequent duty is light bulb replacement. The chief electrician estimates the maintenance staff replaces 12 light bulbs on board vessels daily (Brian Barsons 2009, pers. comm.). Painting also represents a significant portion of the maintenance budget. Despite staff efforts, numerous portions of every vessel exhibit rust and deterioration. The major restoration project in 2010-2011 involved complete restoration of six post-Second World War aircraft located on *Yorktown*’s flight deck (Melissa Buchanan 2011, pers. comm.).

The tidal changes within Charleston Harbor are destructive to untreated and under-maintained steel. Sections of hulls constantly underwater or above the waterline are less susceptible to corrosion (David Clark 2009, pers. comm.). Intertidal corrosion is most notable on *Clamagore*’s outer hull (Photographs 53, 54, 55). The corrosion has not significantly affected the pressure hull, and the submarine’s interior is not yet threatened (David Clark 2009, pers. comm.). Sections of *Clamagore*’s upper hull were removed and repaired beginning in fall 2011 (Melissa Buchanan 2011, pers. comm.). The maintenance department is constantly trying to fix problems that were allowed to proliferate during the museum’s early years.



Photograph 53: Maintenance work on *Clamagore*, September 2011.



Photograph 54: Corrosion on *Clamagore's* hull, June 2009.



Photograph 55: Corrosion on *Clamagore*'s hull, September 2011.

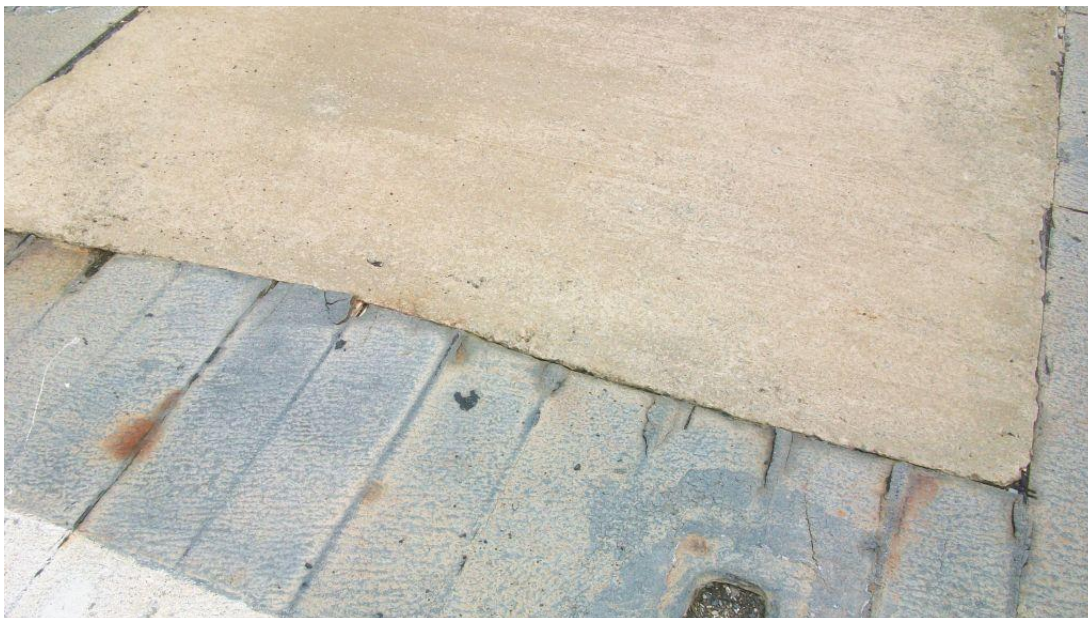
Each warship suffers from major conservation issues beyond normal rust. *Yorktown*'s wooden flight deck deteriorated following the carrier's decommissioning. The deck proved too difficult and expensive to maintain, and in the early 1980's an Executive Director had concrete poured into deteriorated sections of the flight deck (David Clark 2009, pers. comm.). The concretions will require significant resources to remove (Photographs 56 57, 58). *Yorktown* is also suffering rust damage on its hull. The museum has recommended the construction of a cofferdam such as the one protecting *Alabama* in Mobile Bay (David Clark 2009, pers. comm.).



Photograph 56: *Yorktown's* starboard catapult, June 2009.



Photograph 57: *Yorktown's* starboard catapult, September 2011.



Photograph 58: Concrete patch on *Yorktown*'s flight deck.

The most significant damage has occurred to *Laffey*. Prior to *Laffey*'s 1994 relocation (following *Savannah*'s removal), the destroyer was placed in drydock and a steel plate was welded over a hull section exhibiting corrosion (David Clark 2009, pers. comm.). The stopgap measure did not prevent further corrosion; instead, a plate weld began corroding. On 1 December 2008, maintenance workers were cleaning the engine room spaces when their vacuum pulled apart pieces of corroded hull (David Clark 2009, pers. comm.). The hull ruptured directly beneath the forward engine room boiler (Photograph 59). *Laffey*'s hull rested atop several feet of mud, but the compartment rapidly filled with mud and water to a depth of approximately 4 feet (David Clark 2009, pers. comm.). The maintenance staff had to run external pumps continually to drain the engine room. A temporary epoxy patch was applied to the hull on 11 December 2008, but additional ruptures emerged (David Clark 2009, pers. comm.).



Photograph 59: *Laffey*'s hull beneath forward boiler. The corrosion is most visible at upper center, through removed access hatch.

The museum was forced to close *Laffey*, and moved all artifacts on board to *Yorktown* (Photograph 60). On 11 June 2009, South Carolina State Treasurer Converse Chellis announced a \$9 million state government loan for Patriots Point to move *Laffey* to a temporary berth in the South Carolina State Ports Authority dry dock to facilitate hull repairs. The loan was issued in anticipation of a \$20 million federal grant. The repairs were completed despite not receiving the federal funding. The destroyer is now moored at the former Charleston Naval Yard, on property owned by Clemson University (Clemson 16 April 2010). The museum expects *Laffey* to return to the museum site in 2012, depending on the Harbor's dredging schedule (Melissa Buchanan 2011, pers. comm.).



Photograph 60: *Laffey* exhibit in *Yorktown*'s hangar deck. These artifacts are normally displayed aboard the destroyer.

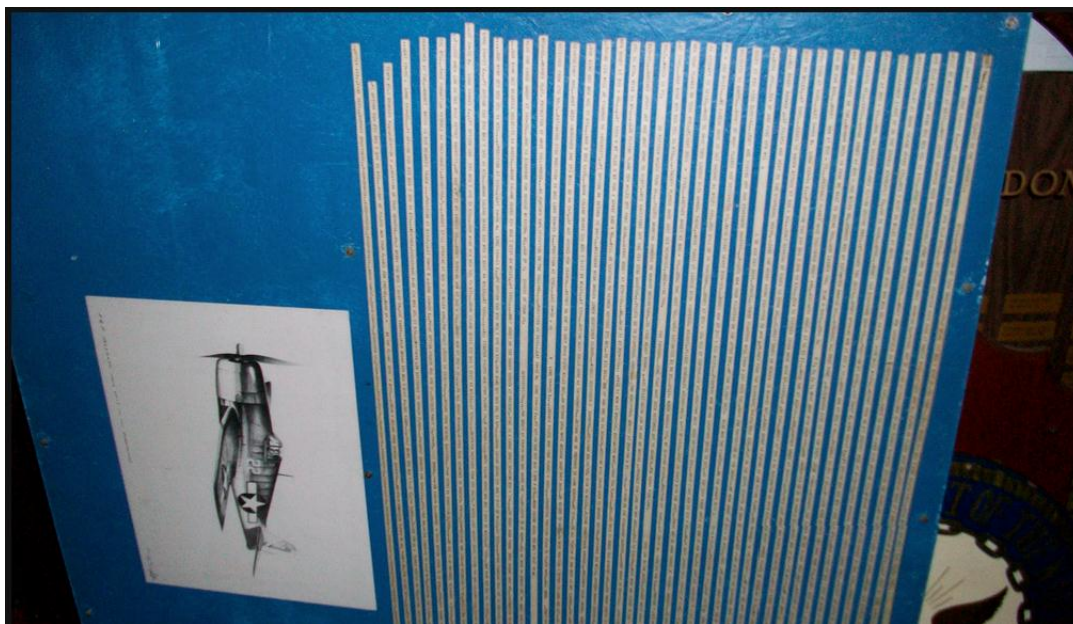
The maintenance problems facing Patriots Point in June 2009 are still prevalent. The museum has downsized its vessel complement, and is looking for long-term solutions to prevent conservation issues exacerbated by years of poor administration. The museum wants the cofferdam, *Laffey*'s return to the museum site, and would like to explore the possibility of mounting *Clamagore* on dry land. Other sites have successfully "beached" submarines, including *Drum* at Battleship USS *Alabama* and *Cavella* at Seawolf Park in Galveston, TX.

Patriots Point has been in operation since 1976. Since opening, the museum has undergone a notable transformation. The museum initially relied heavily upon veterans for exhibit design and content, as well as for interpretation. The lack of directors with museum experience, in addition to a broad and poorly defined mission, severely hampered Patriots Point's ability to maintain its collection, principally by continually acquiring vessels with no clear goal. Though these difficulties have been remedied, the museum has unique organizational duties that pose potential long-term problems. The facility is tethered to a commercial development project.

It is unclear if this administrative coupling has been responsible for problems, or if it could potentially hamper museum operations.

The museum has demonstrated rapid improvement in exhibition and preservation during the last few years. Many older exhibits have been replaced (Photographs 61, 62), *Laffey* has been fully restored, and *Clamagore's* upper hull has been partially repaired. The limited funding relative to maintenance needs has kept the pace of major repairs slower than necessary.

Clamagore's pressure hull still requires protection from intertidal corrosion. *Yorktown's* flight deck remains littered with concrete sections, and it is unclear what can be done to replace these. Plans to construct a cofferdam and moving *Clamagore* onto land may not be as aggressively pursued by the current Board of Directors. These measures, while expensive, represent the optimal way to preserve the hulls and minimize long-term maintenance costs. Inaction and inattention nearly proved fatal to *Laffey*.



Photograph 61: An older exhibit display, illustrative of the lack of professional oversight on third-party exhibits.



Photograph 62: An example of an exhibit, created early in the museum’s lifecycle, that has not been replaced. Typewritten sheets and pictures are pinned to cork board with thumb tacks.

Philadelphia’s Independence Seaport is seeking new ownership of the cruiser *Olympia*, the last remaining Spanish-American War vessel. If no caretaker is found, the vessel will likely be subject to Navy disposal. Patriots Point is facing similar challenges with three ships – the last *Sumner*-class destroyer, the last GUPPY III-modified submarine, and the famous “Fighting Lady” aircraft carrier. Losing any of these vessels would be tragic for the public and for naval historians. The current museum staff have made significant strides in reshaping a museum damaged by neglect and lack of professional leadership, but their task remains monumental.



Photograph 63: Creative interpretation of *Yorktown's* brig.

CHAPTER FIVE
CASE STUDY #3: USS LEXINGTON MUSEUM ON THE BAY

The final case is the USS *Lexington* Museum on the Bay. Located in Corpus Christi, Texas, the privately operated museum acts as caretaker for the aircraft carrier *Lexington*. *Lexington* served from 1943 to 1947 and from 1953 to 1991, and was the last active carrier to have served during the Second World War. *Lexington*'s service life represents one of the broadest windows for historical interpretation of any modern warship preserved by a museum. It also represents one of the newer museum capital warship acquisitions, demonstrating how a museum adapts to the experiences of previous warship museums.

CV-16 was the eighth *Essex*-class aircraft carrier authorized by the U.S. Navy. It was originally assigned the name *Cabot*, but workers at the Bethlehem Steel Company's Fore River shipyard petitioned to rename it *Lexington* to honor the carrier (CV-2) lost during the Battle of the Coral Sea (Power 1996:5). CV-16 was re-designated *Lexington* by Secretary of the Navy Frank Knox on 16 June 1942, prompting the Navy to adopt a policy of reassigning names of sunken aircraft carriers to new hulls (Power 1996:5). The vessel was commissioned 17 February 1943, and conducted a shakedown and training cruise in the Atlantic and Caribbean before transiting the Panama Canal. During this cruise *Lexington* received its air group, (CVG) 16. The group was initially outfitted with obsolete F4F Wildcat fighters, though these were replaced with F6F Hellcats prior to entering combat (Power 1996:5-6). *Lexington* arrived at Pearl Harbor 9 August 1943. The carrier never received a dazzle camouflage; it retained the two-tone blue Measure 21 throughout the war. Japanese propaganda reported "a great blue ship" sunk on four separate occasions during the war, earning *Lexington* the moniker "The Blue Ghost" (Power 1996:44).

Lexington's first combat operations were air strikes against Tarawa on 18 September 1943 (Power 1996:7). As part of Task Group 15.5, the carriers *Lexington*, *Belleau Wood*, and *Princeton* conducted attacks on Japanese installations as field testing for the Navy's system of tactics and logistics that would eventually manifest in the Fast Carrier Task Force and its advance across the Central Pacific. *Lexington* also participated in raids on Wake Island in October and supported the Gilbert Islands landings. Once the Gilberts were secure, the carrier moved to attacking targets in the Marshall Islands until damaged by a Japanese torpedo on 4 December (Power 1996:8). The damage was severe enough to require short-term repairs at Pearl Harbor before the ship retired for more thorough repairs in Bremerton. The carrier departed Bremerton and received a new air group at Alameda, CA, in February 1944 before returning to combat.

Lexington arrived in the Marshalls in March. It joined the "Fast Carrier Task Force," and became Marc Mitscher's flagship for Task Force 58 (TF 58) (Power 1996:9). The task force attacked several island targets to neutralize Japanese outposts. The only damage to *Lexington* during these operations was a fire resulting when a F6F Hellcat crashed into an open elevator pit (Power 1996:10). In June, TF 58 arrived off the Mariana Islands as prelude to invasion. *Lexington* encountered Japanese land-based bombers on 14 June and managed to dodge two torpedo attacks.

The carrier's air group participated in the final major carrier air battle of the Pacific Theater on 19 July. The task force's air power effectively destroyed the Japanese Navy Air Service; the Americans shot down as many as 400 Japanese aircraft with negligible losses (Reynolds 1986:155). The following day, Mitscher ordered American aircraft to search for the Japanese carrier fleet. The first search group failed to locate the Japanese; the second search

group covered a search radius of 475 miles (Taylor 2006:231). The search group finally located the Japanese fleet at 1512, leaving little daylight for a striking distance of approximately 275 miles. Mitscher made the controversial decision to launch an attack, a decision he defended as potentially the last opportunity to deal a decisive blow to the Japanese fleet (Taylor 2006: 232). The first group of strike aircraft was launched by 1630, when Mitscher received reports indicating the Japanese fleet had moved further away.

The attack was successful. The Japanese had lost two carriers to submarine attacks the previous day. Task Force 58's aircraft sank a third, and heavily damaged three other carriers and a battleship (Power 2006:14-15). The aircraft returned to the task force with no cohesion, with little fuel, and in total darkness. Pilots ditched their aircraft, trying to estimate the fleet's proximity. Mitscher then disregarded standing naval doctrine; he walked into the Flag Plot room and ordered the fleet to "turn on the lights." The fleet illuminated itself with every available tool, including searchlights and star shells (Taylor 2006: 234). The fleet was highly visible; to a Japanese submarine it potentially represented a well-lit, target-rich environment. Aircraft were recovered without regard to their home carrier. The maneuver reduced aircraft losses, and severely curtailed pilot loss. Despite the nighttime confusion, the Task Force's air groups were again operational within two days (Power 1996:16). *Lexington's* aircraft spent the remainder of June and the majority of July attacking ground targets in the Marianas.

Throughout late July and early August. *Lexington's* air group attacked targets within bomber range of the Marianas, including Palau and Iwo Jima. On 10 August the ship returned to the Marshall Islands. The task force reorganized under Third Fleet's Admiral William Halsey, with the designation TF 38. Having recaptured the Marianas, the next objective was to liberate the Philippines. The campaign's first component was capturing Palau. Beginning on 6

September *Lexington* attacked numerous island installations to secure air superiority for the landings, including strikes at airfields in western Luzon (Power 1996:17). The task force dispersed to rear area islands and prepared for subsequent operations.

In October, *Lexington* struck Japanese airfields on Formosa and Okinawa, installations within range of the Philippines. The task force's carriers were major targets, and the Japanese conducted a large-scale attack on 24 October against carriers near Luzon. A Japanese carrier fleet was simultaneously spotted north of the Philippines. This prompted *Lexington* to assemble, arm, and launch a strike group toward the Japanese carriers, despite having to engage Japanese attack aircraft at close range (Power 1996:18).

The sighted carrier force was a toothless decoy; Vice Admiral Jisaburo Ozawa commanded a carrier group possessing few aircraft. The Japanese naval strategy for defending the Philippines depended on luring the Fast Carrier Task Force away from the American landing forces. Vice Admiral Takeo Kurita's surface fleet intended to ambush the landing and support forces from the west. The plan failed; Japanese surface forces were repulsed, and the Task Force mauled the once-formidable Japanese carrier fleet. *Lexington* then withdrew to resupply.

On 5 November, *Lexington* experienced its first kamikaze attack. An A6M5 "Zeke" crashed into the island on the starboard quarter. The aircraft disintegrated in the explosion, which damaged the signal bridge, secondary conning station, and multiple anti-aircraft batteries (Power 1996:20). The explosion killed 42 men, but damage control crews quickly suppressed the fire before it damaged the flight deck. *Lexington* was forced to withdraw to Ulithi for repairs. The carrier returned to action on 11 December. The air group resumed strikes on airfields throughout Luzon, as well as attacking harbor facilities. The air group suffered significant losses during the 14 December attacks on Clark Field, the principal American airfield

in the Philippines prior to its capture by the Japanese. The Japanese did not represent the sole threat to the American fleet; a typhoon disrupted *Lexington's* operations from 19 to 22 December (Power 1996:22).



Photograph 64: Marker indicating the 5 November 1944 kamikaze strike.

Following a Christmas respite at Ulithi, *Lexington* spent three weeks neutralizing Japanese airfields and attacking shipping throughout the South China Sea. The air group launched the first American attacks against Japanese-occupied French Indochina on 12 January 1945 (Power 1996:23). The final target during this deployment was Okinawa; following a brief retirement to Ulithi from 22 to 27 January, *Lexington* and the Task Force departed for Japanese waters. Strikes commenced on 16 February; the most formidable obstacle American aircraft encountered was bad weather (Power 1996:26). The air group supported the Iwo Jima landings

on from 19 to 22 February. *Lexington* subsequently was detached from the Task Force and returned to the American west coast for an overhaul.

Lexington remained at the Puget Sound naval yard from 31 March through 22 May due to engine difficulties, and was absent from the task force during the Okinawa invasion. The carrier returned to Japanese waters in early July. Its aircraft spent the war's final month attacking a variety of military and industrial targets on Hokkaido. On 14 August, a strike group was recalled en route to its target; the *Lexington* had received notice of the Japanese surrender (Power 1996:28). *Lexington*'s aircraft received new duties following cessation of hostilities. POW camps were located and rations delivered via airdrop. Combat Air Patrols were still conducted; *Lexington*'s aircraft were airborne during the 2 September surrender signing on board *Missouri*. In ensuing weeks, more patrols and supply missions were conducted over Honshu. Unlike most *Essex*-class carriers, *Lexington* was not utilized for transporting American troops home. The carrier remained active, and did not return to American waters until May 1946. *Lexington* was decommissioned 23 April 1947.

The carrier remained in reserve at Puget Sound. Like *Yorktown*, *Lexington* was not reactivated until after the Korean War. Beginning in September 1953, *Lexington* received the SCB-27C and SCB-125 *Essex*-class modernization programs (Terzibaschitsch 1980:145, 162). These programs installed new steam catapults, added a deck-edge elevator, fitted a "hurricane" (enclosed) bow, altered the island, and added an angled flight deck. The modifications also included installing air conditioning in selected areas, an upgrade not included in *Yorktown*'s SBC-27A modernization (Terzibaschitsch 1980:145). The HVAC modifications would give *Lexington* improved artifact storage and exhibition capabilities as a museum vessel.

Lexington was recommissioned 15 August 1955. It split time between deployment in the western Pacific and training duties off California (Power 1996:31). The carrier was stationed in the South China Sea during the 1958 Laotian Crisis. The growing obsolescence of the Essex-class carriers led to *Lexington*'s redeployment in 1962. It was originally slated to replace *Antietam* as the Navy's training carrier, but the Cuban Missile Crisis preempted that role. The Navy reclassified *Lexington* as an anti-submarine carrier on 1 October 1962 (Power 1996:32). Once the crisis was diffused, it was transferred to training duties in December 1962. *Lexington* operated out of Pensacola as the Navy's training carrier until 1991. During that span, it averaged twenty thousand aircraft launches per year (Power 1996:34). The last carrier in service that saw action during Second World War was finally decommissioned 8 November 1991 (USS *Lexington* 2010b; 2010c).

Following the vessel's decommissioning, the Corpus Christi Area Economic Development Commission lobbied to bring *Lexington* to the Texas city. While operating out of Pensacola, the carrier had utilized Corpus Christi as a port of call. The Commission's lobbying organization, Landing Force 16, raised sufficient funding and community support to win Navy approval for *Lexington*'s donation ("Rocco" Montesano 2010, pers. comm.). The Navy's approval depended on approval by multiple federal, state, and local organizations. The Environmental Protection Agency, the U.S. Army Corps of Engineers, the Governor of Texas, the Texas Air Control Board, the Texas Water Commission, Nueces County, The City of Corpus Christi, and the Corpus Christi Port Authority all were required to sign off on various portions of the proposal (Power 1996:xi).

When the vessel was ballasted, the stern settled almost thirty feet starboard of the intended location. This resulted in *Lexington* settling with a three-degree list to port (Photograph

65). The list has proven useful; the slope drains rainwater and mitigates moisture collection problems beneath the wooden flight deck (“Rusty” Reustle 2010, pers. comm.). *Lexington*’s hull sits in 20 feet of harbor dirt and mud – much shallower than *North Carolina*’s 28-foot draft or *Yorktown*’s 27-foot draft (Judith Whipple 2010; Roger Miller 2007; Melissa Buchanan 2011; pers. comm.).



Photograph 65: Measurable indication the *Lexington* is listing.

USS *Lexington* Museum On The Bay is located north of the shipping channel in Corpus Christi Bay, adjacent to the Texas State Aquarium. These organizations are separated from downtown Corpus Christi by U.S. Highway 181’s Harbor Bridge. The vessel is accessed directly from a city street; a concrete causeway extends from the street to *Lexington* (Photograph 66). The causeway connects to the ship’s starboard side, allowing maximum visibility of Japanese torpedo and kamikaze strike locations. The causeway’s main entrance connects to the ship via the #3 elevator. The connection allows disability access to the hangar deck. This

elevator remains fully operational; the museum uses it when transferring aircraft to or from the flight deck (“Rusty” Reustle 2010, pers. comm.). All museum facilities are located on board, including the ticket offices and gift shop (Photograph 67). Most staff offices are located on the quarterdeck or on the second deck.



Photograph 66: *Lexington* and access causeway.



Photograph 67: Ship's Store and Aircraft Restoration Area, viewed from entrance at #3 Elevator.

During the museum's relatively short existence it has had only two executive directors. The current director, F.W. "Rocco" Montesano, has held the position since 1998. Montesano is an active member and former president of HNSA. The museum's mission is varied but focused. The mission statement encompasses four objectives: maintaining the vessel as a museum focused on naval aviation and the role of the aircraft carrier, preserving the ship, providing the community with a unique educational facility, and fostering pride and patriotism among the public ("Rusty" Reustle 2010, pers. comm.). Prior to the public opening, museum staff received some specialized training from the Smithsonian and the National Museum of the Pacific War / Admiral Nimitz Museum, located in Fredericksburg, Texas (Judith Whipple 2010, pers. comm.).

Lexington's research, curation, and exhibition responsibilities are divided between two positions – the Operations and Exhibits Director and the Historian (USS *Lexington* 2010a). The

Operations and Exhibits Director oversees the design and installation of exhibits as well as managing the vessel's maintenance ("Rusty" Reustle 2010, pers. comm.). The Historian oversees the museum's artifact and document collections and maintains the library, though the library is staffed by volunteers (Photographs 68, 69). The museum does not have a collections policy; the staff rarely declines artifact donations, especially from veterans (Judith Whipple 2010, pers. comm.). Artifact storage, library, and some document storage spaces are climate-controlled. In addition, the majority of tour spaces below the flight deck are climate-controlled. *Lexington's* HVAC system has been modified and upgraded since the ship's decommissioning, though the initial SCB-125 air conditioning installation provided improved starting infrastructure and mitigated vessel modification for the current system ("Rusty" Reustle 2010, pers. comm.). Current air conditioning units are housed on port side gallery deck platforms to make them inconspicuous.



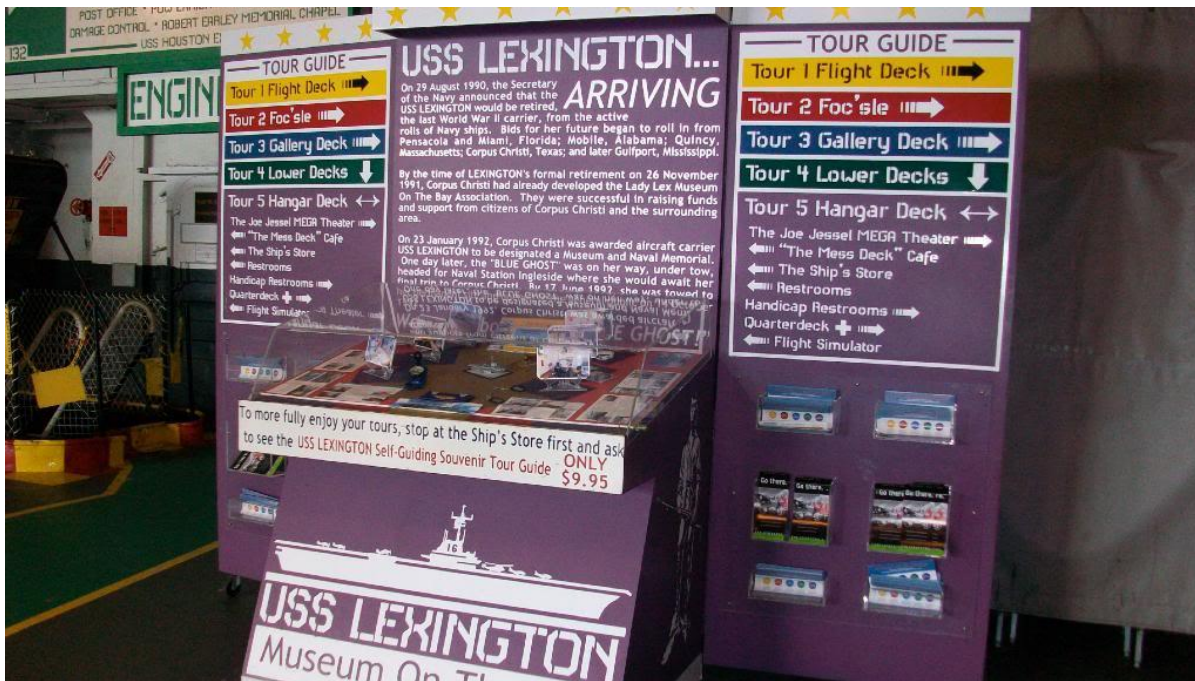
Photograph 68: USS *Lexington* Museum on the Bay's archives.



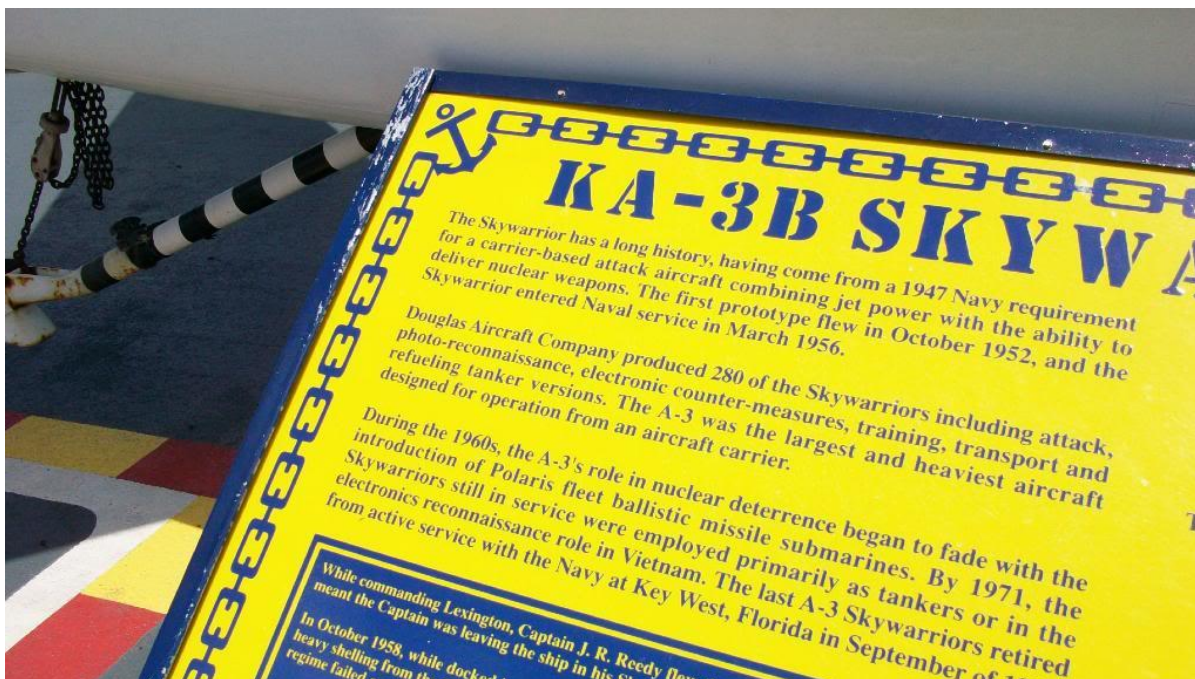
Photograph 69: USS *Lexington* Museum on the Bay’s library.

The museum operates five self-guided tour routes (the hangar deck exhibits comprise a fifth tour route), all starting and ending on the hangar deck. Each tour route is delineated by signage with a specialized color scheme (Photograph 70). The ship’s generalized signage utilizes blue lettering on yellow background, allowing contrast in widely varying levels of light (Photographs 71, 72). The hangar deck houses the ticket office, gift shop, theater, snack bar, aircraft restoration space, and the Virtual Battle Stations exhibit. The principal hangar deck exhibits are Second-World-War-era aircraft, to prevent environmental damage. The aircraft restoration space is located on Hangar Bay 3’s port side. The space is partitioned by vinyl curtains, with transparent “windows” allowing the public to view restorations in progress (Photograph 73). The Virtual Battle Stations Exhibit is a series of computer kiosks with various entertainment programs tangentially related to naval aviation topics (Photograph 74). The forward elevator was renovated to house a 193-seat theater. The theater uses a Megsystems large format projector (USS *Lexington* 2010c). The elevator shaft provided the only space large

enough to facilitate this theater, and theater electronics are housed in the theater's "ceiling" immediately below the flight deck. The electronics are susceptible to moisture penetrating the flight deck, as described below.



Photograph 70: Tour orientation board indicating tour route color-coding.



Photograph 71: Exterior signage.



Photograph 72: Interior signage.



Photograph 73: A-4 Skyhawk undergoing restoration in Aircraft Restoration Area.



Photograph 74: Computer game kiosks on hangar deck.

Tour Route 1 transits the flight deck and island. The flight deck contains post-Second World War aircraft, which are easier to maintain when exposed to sunlight, moisture, and salt from seawater than older aircraft. The island retains its 1991 configuration, and the charthouse has been arranged with maps of Corpus Christi Bay. A 5"/38 caliber twin gun mount, recovered from the cruiser *Des Moines* during scrapping, was donated to the museum and lifted onto the flight deck. This mount represents the primary anti-aircraft batteries from the carrier's pre-1953 configuration. The mount is fully labeled and used in public education programs as a "teachable exhibit" (Photographs 75, 76, 77) (Debbie Crites 2010, pers. comm.). The flight deck underwent a major preservation effort in 2010, as described in detail below.



Photograph 75: 5" turret recovered from *Des Moines*.



Photograph 76: Fully labeled interior of 5".



Photograph 77: Fully labeled interior of 5".

Tour Route 2 (“Foc’sle Tour”) includes the forecastle and a variety of exhibits related to *Lexington*’s history. These exhibits include officer’s quarters and staterooms, exhibits dealing with the original aircraft carrier *Lexington* (CV-2), a Pearl Harbor exhibit and diorama (Photograph 78), a memorial to the battleship *Arizona*, and an exhibit documenting CV-16’s use in the 2001 movie “Pearl Harbor.” Interior spaces used to depict the interior of the Japanese carrier *Akagi* are partially reproduced in this exhibit (Photograph 79). The flight deck was used to film Doolittle Raid scenes, including the takeoff of a restored B-25 Mitchell (“Rusty” Reustle 2010, pers. comm.).



Photograph 78: Large diorama of Pearl Harbor attack, located in Fo’c’sle.



Photograph 79: Partial re-creation of movie set designed to resemble a *Akagi*'s interior.

Tour Route 3 includes several spaces on the gallery deck, highlighting the ship's spaces and featuring Second World War-focused exhibits. The tour includes the CIC and Air Traffic Control Center, both cordoned off by waist-high Plexiglas barriers. A crew berthing space has been arranged to display living conditions on board during the ship's final years of service. Two ready rooms have been restored; one to a Second World War configuration and one in a modern configuration. The Second-World-War-era ready room is not accessible; the room is visible through a bulkhead removed and replaced with Plexiglas, a technique borrowed from other warship museums ("Rusty" Reustle 2010, pers. comm.).

Exhibits are not limited to CV-16's history. Several exhibit spaces are dedicated to specific carriers or carrier classes, including the light carrier *Cabot*. *Cabot* operated as the Spanish carrier *Dédalo* between 1967-1989. Despite efforts to convert the light carrier into a museum, it was scrapped in 2002 ("Rusty" Reustle 2010, pers. comm.). The *Lexington*'s

museum staff was able to recover several artifacts from *Cabot*, and these are included in exhibits throughout the tour route (Photographs 80, 81). The route also includes a large “model room,” featuring military aircraft and ship models donated by area modeling enthusiasts (Photograph 82).



Photograph 80: Propeller recovered from *Cabot*.



Photograph 81: Cactus found growing between planks of *Cabot*'s flight deck.



Photograph 82: Model Room undergoing reorganization.

Tour Route 4 features several working and living facilities, in addition to some ship-specific exhibit spaces. The tour includes many spaces seen in other museum warships, including galley and mess spaces, engine rooms, barber shop, medical spaces, and the post office. An exhibit on board *Lexington* rarely seen elsewhere is the female berthing space. The museum also offers a unique display of Second-World-War-era damage control techniques. These displays utilize unused hatches on the tour route. Some are lit with red bulbs to enhance the presentation (Photograph 83).



Photograph 83: Damage control exhibit on board *Lexington*.

Throughout the tour routes, the museum utilizes both electronic technology and static methods of interpretation. Video screens within exhibits or adjacent to spaces allow for varying methods of description. The most prominent example is within the *Des Moines*' 5"/38 gun mount. A video allows visitors to identify the turret's components and understand their use in firing procedures.

The majority of assisted interpretation involves *Lexington*'s corps of volunteers. As of 2010, the museum had 135 volunteers on its roll, with approximately 100 active participants (Maggie Ramsay 2010, pers. comm.). Volunteers fulfill a variety of roles in the museum. Tour docents operate as either tour guides or station monitors, positioned at key tour stops to enhance

interpretation. Other volunteers assist with public programs, special events, and the “Live Aboard” program.

Many volunteers are Navy veterans, as the City of Corpus Christi has a large population of Navy personnel and retirees. The museum maintains some of the most elaborate volunteer training of any warship museum; the more experienced guides oversee the training and progress of newer volunteers. Tour docents, for example, are required to study assembled material on specific tour sections. Tour guide information packets include multiple-choice tests for evaluation (USS *Lexington* 2010b). Volunteers with research inclinations help assemble information for tour routes and subjects and vessels relevant to the museum (USS *Lexington* 2010b). This reliance on veteran volunteers allows the museum to maintain the program without overburdening the staff. The staff considers the volunteer program successful due to the 82% volunteer retention rate (Maggie Ramsay 2010, pers. comm.).

The museum conducts several public education programs to increase awareness and public visibility. The largest public program is Live Aboard, an overnight on board camping program available to non-profit youth groups (USS *Lexington* 2010c). Live Aboard consists of a self-guided tour, a theater presentation, a flag ceremony, and catered evening and morning meals. The museum also operates Adventures Aboard Ship, a series of educational programs designed for school groups. These programs include demonstrations of simple machines (levers, pulleys, inclined planes) and information hunts utilizing tour routes (USS *Lexington* 2010c).

In *Lexington*'s relatively short museum career, the ship has not experienced the same major preservation issues of vessels further removed from active service. Maintenance and preservation issues remain prevalent. The staff has placed emphasis on observing the errors of other museums in order to avoid committing similar mistakes (“Rusty” Reustle 2010, pers.

comm.). The primary upkeep requirement is painting; the museum employs more painters than any other individual trade, not including painting volunteers (“Rusty” Reustle 2010, pers. comm.). Pigeons also represent a threat to preservation, and must be deterred to keep them from roosting in *Lexington*’s numerous crevices.

The museum’s principal preservation task is conserving the wooden flight deck. *Lexington*’s flight deck originally consisted of teak and mahogany planks; following modernization and decommissioning, 40% of the flight deck was wood and 60% was steel (“Rusty” Reustle 2010, pers. comm.). Wood exposed to moisture and heat eventually rots without significant treatment, and Navy guidelines prohibit the use of polyurethane to seal remaining planks (“Rusty” Reustle 2010, pers. comm.). The museum originally hired a company to install a ½-inch thick rubberized anti-slip coating to preserve the remaining wood and prevent moisture from collecting beneath the flight deck. This coating proved faulty; the coating was improperly applied and allowed condensation to seep through the flight deck, threatening the theater’s electronics (“Rusty” Reustle 2010, pers. comm.).

The museum conducted a six-year study to determine a suitable replacement for the rubber coating. A section of it was removed from the forward flight deck and replaced with an asphalt compound (Photograph 84). The decision to use the asphalt compound was difficult for museum staff; the compound was not historically authentic, but had cost less to maintain than the rubber coating. The asphalt’s installation was also entirely reversible; if the compound proves problematic at a future date, it will be possible to remove without the effort required to remove the rubber coating (“Rocco” Montesano 2010, pers. comm.). This test section experienced no detrimental effects and succeeded in keeping moisture away from electronics on the gallery and hangar decks, including the theater’s overhead electronics. Staff began removing the remaining

rubber coating in spring 2010 (Photograph 85). The museum scheduled further installation of the asphalt compound for September 2010, in expectation of the rubber coating's complete removal ("Rusty" Reustle 2010, pers. comm.).



Photograph 84: Portion of asphalt compound test section. Wood stripped of the rubber coating is visible at right.



Photograph 85: Museum staff removing the rubber coating from the flight deck.

Maintenance includes periodic consultation with Federal and Navy inspectors. *Lexington* is classified as a “nonconforming marine structure,” and requires specialized reports for fire and environmental agencies (“Rusty” Reustle 2010, pers. comm.). Second-World-War-era Navy vessels contained numerous materials now considered harmful. Before the ship could be opened to the public, several infrastructural elements had to be upgraded, and potentially hazardous materials had to be secured. Plumbing for public and Live Aboard use required rebuilding (“Rusty” Reustle 2010, pers. comm.).

The Navy’s Ship Donation Inspection Program conducts annual reviews of *Lexington*. Inspections are conducted by a team of 14 Navy specialists (“Rusty” Reustle 2010, pers. comm.). Upon arrival at the museum location, significant quantities of trash and irreparable fixtures were removed under Navy monitoring (“Rusty” Reustle 2010, pers. comm.). The Navy inspectors’ reports have been favorable, likely due in part to the relatively low number of structural modifications the museum has made. *Lexington*’s hatch coamings have not been modified; tour routes are replete with signs warning of tripping and low overhang hazards.

USS *Lexington* Museum On the Bay has been open for less than twenty years. The museum started with the benefit of advanced knowledge of exhibition and preservation experiences of older warship museums. The organization maintains a clear and specific museum mission. The executive directors have remained active not only in maintaining museum standards, but also in marketing and increasing the museum’s visibility and recognition. The exhibit design is similar to *Yorktown*’s; exhibit spaces are dedicated to other carriers and carrier classes. Professional museum personnel created *Lexington*’s exhibits (except the model display room), and, as a result, problems with third-party displays never materialized.

Lexington's shortcomings are largely curatorial in nature. The lack of a collections policy is a deficiency with inevitable consequences. If this is corrected, *Lexington* will be one of the most efficiently and professionally run warship museums in the country. The hangar deck technology kiosks would benefit from revision. The video game software does not significantly add to the ship's interpretation. A potential alliance with a flight simulator designer could allow *Lexington* to demonstrate the carrier's history better.

Preservation issues on board *Lexington* do not represent the major problems found in the other two case studies. In large part, this is due to its shorter tenure as a museum vessel. The museum staff anticipates significant problems as the ship continues to age. They emphasize the experiences of other museums, particularly older aircraft carrier museum vessels (*Yorktown* and *Intrepid*). Despite the museum's status as a private organization, the organization receives non-monetary support from and is highly visible among the city, county, and area military population.

CONCLUSION

The objective of this research was to develop a better understanding of the unique needs and practices of warship museums, and the solutions the museums employ. The warship museum has many functions of a traditional history museum, including display space, museum offices, support infrastructure, and classroom. Unlike a traditional terrestrial museum, a warship museum is itself an artifact housing most traditional functions. The “building” is also an artifact, requiring constant oversight and maintenance. Unlike an historic house or site, the artifact has specialized maintenance needs resulting from sitting in water. Even if the vessel were moved to a stable dry location, the artifact is still a ship requiring specific preservation practices. The case studies demonstrate the distinctive characteristics, and their responses.

The case studies demonstrate varied conditions under which warship museums operate, and each case presents unique organizational strengths. All three museums exhibit several common curatorial, exhibition, and preservation practices to overcome common issues. These museums have overcome the lack of a supporting body of research through frequent communication with other museum vessels (Kim Sincox 2007; “Rocco” Montesano 2010; Melissa Buchanan 2011; pers. comm.). Warship museums have developed and networked organizational, curatorial, and preservation practices, utilizing both inter-museum communication and independent experience.

Battleship *North Carolina* is the oldest museum organization and possesses the oldest vessel. In fifty years, the museum has developed a specific and focused mission – the interpretation of all naval vessels named *North Carolina* and memorializing all North Carolinians killed during the Second World War. The museum operates a single vessel with oversight, but not funding, from the state cultural agency. The organization possesses a clear

museum mission, with strong executive directorship, a strong curatorial department, and a well-developed and defined collections policy. Despite the emphasis on curation and collections management, the museum has developed effective public programs and capitalized on the vessel's paranormal qualities in popular history.

North Carolina has a single tour route that minimizes redundancy and, using the modifications to Turret #2's magazine, allows access unparalleled on board other battleships. Exhibit spaces utilize white human silhouettes instead of mannequins, as a measure of economy. This can be distracting, but the silhouettes' relatively low cost allows the museum to use them in quantity to highlight the cramped nature of working spaces. The exhibit spaces also do not utilize significant amounts of electronic technology, relying on static displays.

Patriots Point Naval and Maritime Museum has been the revolving door of warship museums. It has been responsible for six different vessels in thirty-five years. Half those vessels have since been donated to other organizations or disposed. These acquisitions were primarily the result of poor leadership at the Authority and director levels, and the excess of vessels contributed to poor preservation techniques. The museum is still recovering from proverbially biting off more than it could chew. Exhibits have undergone a radical transformation since the museum's opening. Initially reliant on third-party veterans organizations, the exhibit staff has significantly improved the displays in recent years. Technology is a major component of future exhibits; computer terminals are rapidly being integrated into existing displays.

Preservation and maintenance remain Patriots Point's primary concerns. All three ships have presented major restoration requirements in recent years. *Laffey*'s needs manifested in 2008 with near-catastrophic hull corrosion. Careful monitoring of *Clamagore*'s hull could prevent a similar breach. *Yorktown*'s flight deck is littered with concrete patches, which cannot

be easily or inexpensively removed. Patriots Point has demonstrated improvement in recent years, undertaking necessary major conservation projects and significantly overhauling exhibit spaces, but more work is required.

USS *Lexington* Museum by the Bay is a relatively young organization, and has benefitted immensely from the errors of older museums. The board of directors and museum staff demonstrate a clear understanding of balancing museum operations with public outreach. Exhibits are similar to those on *Yorktown*, though *Lexington*'s staff has largely avoided third-party exhibit design. The curatorial staff has omitted the basic museum practice of maintaining a collections policy. If not remedied, this could potentially pose a problem of collection excess in the future. The museum has developed a strong volunteer program, capitalizing on the area's military population. Several exhibits utilize electronic technology, although it has not improved the vessel's interpretation in every instance.

Warship museum organizations do not differ significantly from terrestrial museums. Both require skilled specialists and a director aware of the museum's needs and role within the community. Flaws within museum organizations can cascade into flaws in curatorial and preservation practices. These flaws can be further compounded in multiple-warship museums. Museum organizations which placed emphasis on senior military command experience without at the expense of civilian administration or museum training, especially in the case of Patriots Point. The three current executive directors have emphasized marketing and commercial ties to the community and their profession, while still having military command service in their backgrounds. Exhibit specialists are more cognizant of curatorial and exhibition practices, and have moved away from displays created by untrained groups, such as enthusiastic veterans. Collections managers are still highly varied; *North Carolina* clearly offers strong and well-

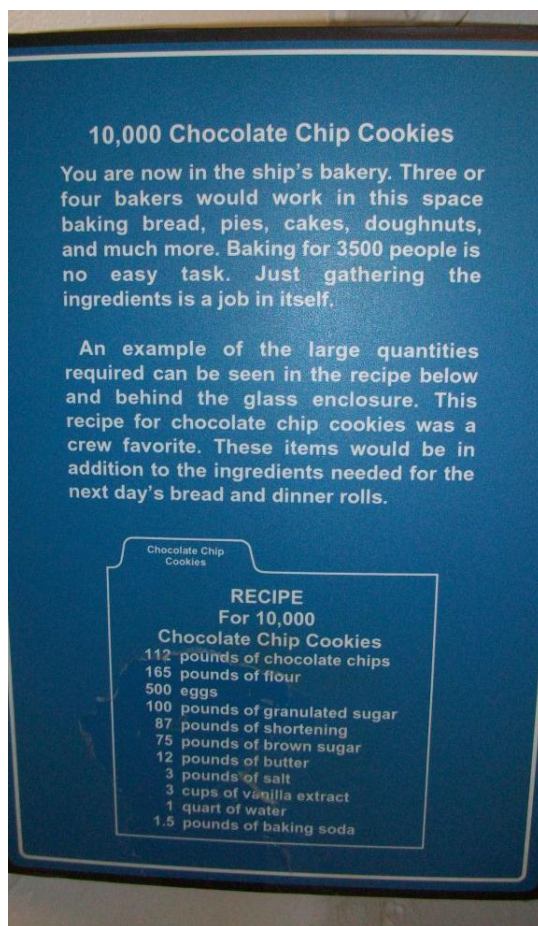
recognized collection management, while *Lexington*'s absence of a collections policy and unwillingness to decline artifact donations may prove detrimental in the future. All three sites place a heavy emphasis on education and outreach; each museum emphasizes the need to use innovative programs to increase public awareness and recognition.

Preservation issues detailed in the case studies seem to reaffirm the quantitative analysis; preservation issues are not simply a factor of the length of time since decommissioning, but are heavily influenced by the amount of time between a ship's decommissioning and donation to a museum organization. Major conservation issues persist, and the timeliness of response varies. *North Carolina* is trying to be pro-active in minimizing hull corrosion damage. The 2010 approval for a cofferdam and ensuing hull conservation work will potentially prevent a catastrophic hull event such as occurred with *Laffey* in 2008-2009. *Laffey*'s drydocking was expensive and required emergency funding from the State of South Carolina, a measure normally anathema to the nature of a state enterprise agency. Patriots Point represents the potential consequences of failing to repair or monitor corrosion.

An analysis of exhibit observations also establishes a pattern of curatorial evolution. Two of the three case studies concern warships converted to museum vessels in the 1960s and 1970s, during periods of preservation activity involving large Second World War veteran populations. Early exhibits at these museums were built with the assumption that most visitors would tour the vessels with friends or family members who served during the conflict. In the case of Patriots Point, veterans were used as a crutch – they allowed outside groups such as veterans organizations to design and install exhibits with little oversight by museum staff. Museum staff identified pictures used in some of these exhibits as containing inappropriate material for the general museum-going public – especially young museum visitors (Tom Sprowl

2011, pers. comm.). As the Second World War veteran population dwindled, curatorial efforts placed an increased emphasis on established museum techniques.

Museum warships all possess common spaces and themes to interpret – the concepts of a floating weapon that had to function as a partially self-sustaining city (Photograph 43). All three case studies present crew berths, machine shops, post office, sick bay, and the CiC spaces with some similarities in displays. The varying missions of each museum have brought about diverse exhibits similar to terrestrial museums. The “Black Americans in the U.S. Navy” exhibit aboard *Yorktown* is a unique creation of the museum, as is *Lexington*’s “Pearl Harbor” movie exhibit.



Photograph 86: Recipes designed to serve large crews are a common and easy way of conveying a museum warship's function as a floating city, and interpreting cooking spaces such as *Yorktown*'s bakery.

It cannot be stressed enough that these case studies are a small sampling of the 110 warships preserved in 73 separate museum organizations. This research is intended to foster further investigation into this unique museum type. Several new questions emerged from this research. The disadvantages of multi-vessel warship museums are evident from Patriots Point's trials. It is not certain to what extent acquisition of multiple vessels hampered the museum as opposed to organizational shortcomings. There are 37 museums with multiple warships. Only five multiple-warship museums – Patriots Point, Battleship Cove, *Intrepid* Sea-Air-Space Museum, Battleship Memorial Park, and Buffalo & Erie County Naval & Military Park – exhibit vessels of VCN 1-3 (aircraft carriers, battleships, and cruisers). Contrasting these five museums could produce a more complete picture of an even smaller subset of museums with significantly more intense preservation and exhibition demands.

The scope of this research has been limited to American warships in American museums. The United States possesses the greatest number and variety of warship museums due to its twentieth century wartime industrial output. International comparisons offer opportunities to contrast cultural differences in warship museum theory, curatorial processes, and funding – especially in nations such as Germany and Japan where modern international conflict is now viewed differently. Given the number of academic museum studies programs throughout the United States and the world, a program specializing in maritime museum studies could greatly benefit the museum world.

This research becomes important given the current state of flux with several historic warships. The USS *Iowa*, the last remaining battleship not preserved as a museum, remains in Suisun Bay, California. The Los Angeles-based Pacific Battleship Center has secured loans, and support from the City of Los Angeles, to renovate *Iowa* and display it at San Pedro (Bloomberg

BusinessWeek 2011; NAVSEA 2011). This museum will center around a commercial development (Bloomberg BusinessWeek 2011; Los Angeles Times 2011). The extent of commercial development involvement is unclear, though the Patriots Point Development Authority could provide a theoretical blueprint for centering a maritime-focused commercial project on a warship museum. It is also uncertain how much restoration work *Iowa* would require to satisfy Navy inspectors.

Iowa has likely suffered some degree of deterioration while in reserve, but its condition is certainly more favorable than that of *Olympia*. Dewey's Manila Bay flagship, a museum vessel since 1957, has avoided disposal in recent years despite major hull compromising at and below the waterline. Its current museum organization, Independence Seaport Museum, assumed responsibility from the vessel's original museum organization, Cruiser *Olympia* Association, in 1996 (HNSA 2008). Independence Seaport was prepared to close the vessel to the public in November 2010. The ship remained open on a limited schedule, despite needing repair costs estimated in excess of \$10 million (*Philadelphia Enquirer* 2010). Independence Seaport is currently seeking another museum organization willing to repair and exhibit the vessel. As of September 2011 nonprofit organizations in Philadelphia, Washington, DC, Baltimore, Beaufort, South Carolina, and Vallejo, California, have expressed interest in acquiring the vessel (*Philadelphia Enquirer* 2011).

Future Navy warship donations will be heavily influenced by the experiences of all American warship museums. The selected case studies present a variety of conditions, experiences, and techniques that showcase the unique demands and benefits of preserving and exhibiting warships. The floating fortress, floating city, floating museum is a highly specialized

confluence within the museum world, and its specialized needs and unique offerings must be considered given the fragility of the ship's existence.

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- 2009c Navy Ship Donation Program Manual (NAVSEAINST 4520.1B)
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- 2010a Museum history and staff organization charts.
- 2010b Volunteer information packet.
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- 2005 Navy’s Last Two Battleships to be Decommissioned. 21 December.

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APPENDIX A: LIST OF MUSEUM STAFF COMMUNICATIONS

Barsons, Brian	10 June 2009
Blankenship, Don:	3 December 2010
Breland, Charles:	20 November 2007
Buchanan, Melissa:	10 June 2009
	16 September 2011
Clark, David:	10-11 June 2009
Crites, Debbie:	26 May 2010
Knoess, Wilhelm:	10 November 2010
Loftin, Heather:	9 December 2009
Miller, Roger:	13 September 2007
	9 December 2009
	20 October 2011
Macfarlane Louise:	18 November 2010
Montesano, F.W. "Rocco"	27 May 2010
Ramsey, Maggie:	26 May 2010
Reed, Darin	16 September 2011
Reustle, M. Charles "Rusty":	26-27 May 2010
Sahari, Aaro:	9 November 2010
Sheret, Mary Ames:	13 September 2007
	19 November 2007
	9 December 2009

Sincox, Kim:	13 September 2007
	19 November 2007
	9 December 2009
Sprowl, Tom	16 September 2011
Van Hee, Ilse:	10 November 2010
Wallace, Danielle:	9 December 2009
Whipple, Judith:	26 May 2010
Whitlock, Joe:	11 June 2009
Wimett, Eleanor:	10 June 2009

APPENDIX B: WARSHIP MUSEUM DATABASE

Vessel	Nationality	City	State	Country	Vessel Classification	SpecC ondr	Operat onal	Dry Dock	Indo rs	Raise d	Wreck ed	Disas mbled	Close d	Mark ed for	Decom mission Date	Service Date	Interre gnum	Museu m Date	Intere gnum	Tiers
ARA Presidente Sarmiento	Argentina	Buenos Aires	N/A	Argentina	Sailing	8 None	No	No	No	No	No	No	No	No	1887	1961	1964	3	1	
ARA Uruguay	Argentina	Buenos Aires	N/A	Argentina	Gunboat	5 None	No	No	No	No	No	No	No	No	1874	1926	1967	41	8	
HMAS Castlemaine	Australia	Williamstown	Victoria	Australia	Minesweeper	5 None	No	No	No	No	No	No	No	No	1942	1945	1974	29	6	
HMAS Diamantina	Australia	South Brisbane	Queensland	Australia	Frigate	5 Yes	No	Yes	No	No	No	No	Yes	No	1944	1980	1980	0	1	
HMAS Advance	Australia	Sydney	New South Wales	Australia	Patrol Boat	6 Yes	Yes	No	No	No	No	No	Yes	No	1967	1988	1988	0	1	
HMAS Whyalla	Australia	Whyalla	South Australia	Australia	Minesweeper	5 Yes	No	Yes	No	No	No	No	Yes	No	1942	1946	1988	42	8	
HMAS Vampire	Australia	Sydney	New South Wales	Australia	Destroyer	4 None	No	No	No	No	No	No	Yes	No	1959	1986	1997	11	3	
HMAS Onslow	Australia	Sydney	New South Wales	Australia	Submarine	7 None	No	No	No	No	No	No	Yes	No	1969	1999	1999	0	1	
HMAS Ovens	Australia	Fremantle	Western Australia	Australia	Submarine	7 Yes	No	Yes	No	No	No	No	Yes	No	1969	1995	2001	6	2	
Oudenaarde	Belgium	Antwerp	N/A	Belgium	Minesweeper	5 Yes	No	Yes	No	No	No	No	No	No	1959	1989	1989	0	1	
Russian Submarine U-480 (B-143)	Russian	Zeebrugge	N/A	Belgium	Submarine	7 None	No	No	No	No	No	No	No	No	1960	1994	1996	2	1	
Rachuelo	Brazil	Rio de Janeiro	N/A	Brazil	Submarine	7 None	No	No	No	No	No	No	No	No	1977	1997	1997	0	1	
Bauru (ex-USN McAnn)	United States	Rio de Janeiro	N/A	Brazil	Destroyer	4 None	No	No	No	No	No	No	No	No	1944	1973	1982	9	2	
Draki	Bulgaria	Varna	N/A	Bulgaria	Torpedo Boat	6 Yes	No	Yes	No	No	No	No	No	No	1908	1954	1957	3	1	
HMCS Haida	Canada	Hamilton	Ontario	Canada	Destroyer	4 None	No	No	No	No	No	No	Yes	No	1942	1963	1965	2	1	
HMCS Bras D'Or	Canada	L'Islet	Quebec	Canada	Hydrofoil	10 Yes	No	Yes	No	No	No	No	No	No	1968	1971	1980	9	2	
HMCS Sudville	Canada	Halifax	Nova Scotia	Canada	Corvette	5 None	No	No	No	No	No	No	Yes	No	1941	1946	1983	37	7	
HMCS Onondaga	Canada	Rimouski	Quebec	Canada	Submarine	7 Yes	No	Yes	No	No	No	No	Yes	No	1967	2000	2009	9	2	
Huascar	Peru	Takahuano	N/A	Chile	Monitor	5 None	No	No	No	No	No	No	No	No	1887	1934	1952	18	4	
Zhong Shan/Chung Shan	China	Hong Kong	N/A	China	Gunboat	5 Yes	No	Yes	Yes	No	No	No	No	No	1913	1938	1997	59	9	
Osa-class Missile Boat #B139	China	Beijing	N/A	China	Missile Boat	5 Yes	No	Yes	No	No	No	No	No	No	1946	1980	1980	0	1	
Coridoba (ex-USN Rachamkin)	United States	Toanocpa	N/A	Columbia	Transport	10 Yes	No	No	No	No	No	No	No	No	1942	1945	1959	14	3	
CB-20	Italy	Zagreb	N/A	Croatia	Submarine	7 Yes	No	Yes	Yes	Yes	No	No	No	No	1862	1908	1984	76	10	
Fregatten Jylland	Denmark	Ebeltoft	N/A	Denmark	Frigate	9 Yes	No	Yes	No	No	No	No	No	No	1964	1989	1991	2	1	
Solbjørnen	Denmark	Aalborg	N/A	Denmark	Torpedo Boat	6 Yes	No	Yes	No	No	No	No	No	No	1964	1989	1991	2	1	
Springreen	Denmark	Aalborg	N/A	Denmark	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	1964	1989	1992	3	1	
Russian Submarine U-359 (S-359)	Russia	Nakskov	N/A	Denmark	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	1953	1989	1994	5	1	
Lembik	Estonia	Tallin	N/A	Estonia	Submarine	7 None	No	No	No	No	No	No	No	No	1937	1979	1979	0	1	

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C. and	Operational	Indoor	Raise	Wreck	Disassembled	Marked for	HMSA	Core	Service Date	Decommission Date	Museum	Interpretive	Tiers
Vesikko	Finland	Helinkki	N/A	Finland	Submarine	7	Yes	No	No	No	No	No	No	No	No	1934	1946	1973	27	6
VNM 11 "Vemmas"	Finland	Kokka	N/A	Finland	Patrol Boat	6	Yes	No	No	No	No	No	No	No	No	1933	1970	1992	22	5
Kehasalmi	Finland	Turku	N/A	Finland	Mine layer	5	None	No	No	No	No	No	No	No	No	1957	1994	1994	0	1
Alose	France	Marseille	N/A	France	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	1904	1918	1977	59	9
Seehund (German) (S-622)	Germany	Brest	N/A	France	Submarine	7	Yes	No	No	No	No	No	No	No	No	1945	1953	1988	35	7
Maille-Breze	France	Nantes	N/A	France	Destroyer	4	None	No	No	No	No	No	No	No	No	1957	1988	1988	0	1
Argonaute	France	Paris	N/A	France	Submarine	7	Yes	No	No	No	No	No	No	No	No	1958	1982	1991	9	2
Colbert	France	Bordeaux	N/A	France	Cruiser	3	Yes	No	No	No	Yes	No	Yes	No	No	1959	1991	1993	2	1
U-1	Germany	Munich	N/A	Germany	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	1906	1919	1921	2	1
U-995	Germany	Kiel	N/A	Germany	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	1943	1945	1971	26	6
Wilhelm Bauer (U-2540)	Germany	Bremenhaven	N/A	Germany	Submarine	7	None	No	No	No	No	No	No	No	No	1945	1982	1984	2	1
U-9 (S-188)	(West)	Speyer	N/A	Germany	Submarine	7	Yes	No	No	No	No	No	No	No	No	1967	1993	1993	0	1
U-10 (S-189)	(West)	Wilhelmshaven	N/A	Germany	Submarine	7	None	No	No	No	No	No	No	No	No	1967	1993	1994	1	1
Weilheim (M-1077)	(West)	Wilhelmshaven	N/A	Germany	Minesweeper	5	None	No	No	No	No	No	No	No	No	1958	1995	1997	2	1
Russian Submarine U-461 (K-24)	Russia	Peenemunde	N/A	Germany	Submarine	7	None	No	No	No	No	No	No	No	No	1965	1991	1998	7	2
Libelle-class #952	Germany (East)	Wilhelmshaven	N/A	Germany	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	1976	1986	2001	15	3
Russian Submarine U-434 (B-515)	Russia	Hamburg	N/A	Germany	Submarine	7	None	No	No	No	No	No	No	No	No	1976	2000	2002	2	1
Hans Bernier	Germany (East)	Peenemunde	N/A	Germany	Missile Boat	5	None	No	No	No	No	No	No	No	No	1986	1990	2002	12	3
Molders (D-186)	(West)	Wilhelmshaven	N/A	Germany	Destroyer	4	None	No	No	No	No	No	No	No	No	1969	2003	2005	2	1
Libelle-class #924	Germany (East)	Danholm	N/A	Germany	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	1975	1989			
Libelle-class #963	Germany (East)	Dresen	N/A	Germany	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	1976	1989			
Libelle-class #925	Germany (East)	Hamburg	N/A	Germany	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	1975	1984			
B/S Georgios Averof	Greece	Athens	N/A	Greece	Cruiser	3	None	No	No	No	No	No	No	Yes	No	1910	1952	1984	32	7
HMS Velos (USS Charrette)	Greece	Athens	N/A	Greece	Destroyer	4	None	No	No	No	No	No	No	No	No	1943	1991	1994	3	1
Leitha	Hungary	Budapest	N/A	Hungary	Monitor	5	Yes	No	No	No	No	No	No	No	No	1871	1921	2005	84	10
INS Al P Chen	Israel	Haifa	N/A	Israel	Landing Craft	6	Yes	No	Yes	No	No	No	No	Yes	No	1941	1958	1968	10	2
INS Miztach	Israel	Haifa	N/A	Israel	Missile Boat	5	Yes	No	Yes	No	No	No	No	Yes	No	1967	1996	1996	0	1
INS Gal	Israel	Haifa	N/A	Israel	Submarine	7	Yes	No	Yes	No	No	No	No	Yes	No	1975	2007			
INS Dabur	Israel	Haifa	N/A	Israel	Patrol Boat	6	Yes	No	Yes	No	No	No	No	Yes	No	1970				

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C and	Operational	Indoor	Raise	Wreck	Disassembled	Marked for	HMSA	Core	Service Date	Decommission Date	Interment Date	Tiers		
Puglia	Italy	Vitoriale	N/A	Italy	Cruiser	3	Yes	No	No	No	No	No	No	No	No	No	1901	1923	1925	2	1
MAS-15	Italy	Rome	N/A	Italy	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	No	1916	1936	1936	0	1
Enrico Toti	Italy	Milan	N/A	Italy	Submarine	7	Yes	No	No	No	No	No	No	No	No	No	1968	1992	2005	13	3
CB-22	Italy	Trieste	N/A	Italy	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	No	1942	1943			
Enrico Dandolo (S-513)	Italy	Venice	N/A	Italy	Submarine	7	Yes	No	No	No	No	No	No	No	No	No	1968	1993			
MAS-96	Italy	Vitoriale	N/A	Italy	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	No	1917				
Mikasa	Japan	Yokosuka	N/A	Japan	Battleship	2	Yes	No	Yes	No	No	No	No	No	No	No	1902	1923	1925	2	1
Kairyu-type	Japan	Etsujima	N/A	Japan	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	No	1945				
SriTrennganu	Malaysia	Malacca	N/A	Malaysia	Patrol Boat	6	Yes	No	Yes	No	No	No	No	No	No	No	1961				
Hr. Ms. Buffel	Netherlands	Rotterdam	N/A	Netherlands	Ironclad	5	Yes	No	No	No	No	No	No	No	No	No	1868	1973	1974	1	1
HNLMS Schorpioen	Netherlands	Den Helder	N/A	Netherlands	Ironclad	5	Yes	No	Yes	No	No	No	No	No	No	No	1868	1906	1982	76	10
Hr. Ms. Mercuur	Netherlands	Scheveningen	N/A	Netherlands	Minesweeper	5	None	No	No	No	No	No	No	No	No	No	1953	1987	1993	6	2
HNLMS Tonijn	Netherlands	Den Helder	N/A	Netherlands	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	No	1966	1991	1994	3	1
HMS Elin	Kingdom	Zaan	N/A	Netherlands	Auxiliary	10	Yes	No	No	No	No	No	No	No	No	No	1934	1957	1995	38	7
HNLMS Abraham Crijnsen	Netherlands	Den Helder	N/A	Netherlands	Minesweeper	5	None	No	No	No	No	No	No	No	No	No	1937	1992	1997	5	1
Hr. Ms. Nahu	Netherlands	Amsterdam	N/A	Netherlands	Minesweeper	5	Yes	No	No	No	No	No	No	No	No	No	1961	1983	2003	20	4
L-9512	Netherlands	Amsterdam	N/A	Netherlands	Landing Craft	6	Yes	No	Yes	No	No	No	No	No	No	No	1962		2004		
Hr. Ms. Bonaire	Netherlands	Den Helder	N/A	Netherlands	Gunboat	5	Yes	No	Yes	No	No	No	No	No	No	No	1877	1924	2005	81	10
U-111 (B-80)	Russia	Amsterdam	N/A	Netherlands	Submarine	7	None	No	No	No	No	No	No	No	No	No	1957	1990			
USS Pueblo	United States	Pyeongang	N/A	North Korea	Auxiliary	10	None	No	No	No	No	No	No	No	No	No	1967	1968	1999	31	7
M314 Alta	Norway	Oslo	N/A	Norway	Minesweeper	5	Yes	No	No	No	No	No	No	No	No	No	1953	1996	1996	0	1
HNoMS Blink (MTB P-961)	Norway	Horten	N/A	Norway	Torpedo Boat	6	None	No	No	No	No	No	No	No	No	No	1965				
HNoMS Flap	Norway	Horten	N/A	Norway	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	No	1873	1920			
HNoMS Skrei	Norway	Horten	N/A	Norway	Patrol Boat	6	Yes	No	Yes	No	No	No	No	No	No	No	1960	1989			
HNoMS Ullstein	Norway	Horten	N/A	Norway	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	No	1991				
HNoMS Hlitz (SC-718)	United States	Haakonvern	N/A	Norway	Sub Chaser	5	Yes	No	No	Yes	No	No	No	No	No	No	1943	1954	1981	27	6
PMS Hangor	Pakistan	Karachi	N/A	Pakistan	Submarine	7	None	No	No	No	No	No	No	No	No	No	1971	2006	2007	1	1
SK-404	Pakistan	Karachi	N/A	Pakistan	Submarine	7	None	No	No	No	No	No	No	No	No	No					
PMS Mujibin (USS MSC-261)	United States	Karachi	N/A	Pakistan	Minesweeper	5	None	No	No	No	No	No	No	No	No	No	1956	1995			
BAP Abtao	Peru	Callao	N/A	Peru	Submarine	7	None	No	No	No	No	No	No	No	No	No	1954	1998	2004	6	2

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C and	Operational	Indoor	Raise	Wreck	Disassembled	Marked for	HMSA	Core	Service Date	Decommission Date	Museum	Interpreting	Tiers
BAP America	Peru	Iquitos	N/A	Peru	Gunboat	5 None	No	No	No	No	No	No	No	No	No	No	1904			
Blyskawica	Poland	Gdynia	N/A	Poland	Destroyer	4 None	No	No	No	No	No	No	No	No	No	No	1937	1976	1976	0 1
Cruiser Aurora	Russia	St. Petersburg	N/A	Russia	Cruiser	3 None	No	No	No	No	No	No	No	No	No	No	1900	1956	1956	0 1
Krasny Vympel	Russia	Vladivostok	N/A	Russia	Auxiliary	10 None	No	No	No	No	No	No	No	No	No	No	1911	1945	1958	13 3
S-56	Russia	Vladivostok	N/A	Russia	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1941	1955	1975	20 4
K-21 (S-21)	Russia	Severomorsk	N/A	Russia	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1941	1959	1982	23 5
Narodovolec (D-2)	Russia	St. Petersburg	N/A	Russia	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1931	1987	1989	2 1
B-413 (Soviet)	Russia	Kaliningrad	N/A	Russia	Submarine	7 None	No	No	No	No	No	No	No	No	No	No	1968	1989	2000	1 1
SAS Durban	South Africa	Durban	N/A	South Africa	Minesweeper	5 None	No	No	No	No	No	No	No	No	No	No	1957			
Peral	Spain	Cartagena	N/A	Spain	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1888	1890		
S4-42 (F-II)	Spain	Cartagena	N/A	Spain	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1957	1971		
HMS Hjalen	Sweden	Karlskrona	N/A	Sweden	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1904	1922	1932	10 2
HMS Vasa	Sweden	Stockholm	N/A	Sweden	Sailing	8 Yes	No	Yes	Yes	No	No	No	No	No	No	No	1628	1628	1961	333 10
U-3	Sweden	Malmö	N/A	Sweden	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	No	No	1943	1964	1965	1 1
T38	Sweden	Karlskrona	N/A	Sweden	Patrol Boat	6 Yes	Yes	No	No	No	No	No	No	No	No	No	1951	1975	1978	3 1
T46	Sweden	Stockholm	N/A	Sweden	Patrol Boat	6 Yes	No	No	No	No	No	No	No	No	No	No	1946	1975	1978	3 1
T26	Sweden	Stockholm	N/A	Sweden	Patrol Boat	6 Yes	Yes	No	No	No	No	No	No	No	No	No	1943	1957	1985	28 6
HMS Smaland	Sweden	Göteborg	N/A	Sweden	Destroyer	4 None	No	No	No	No	No	No	No	No	No	No	1956	1984	1987	3 1
HMS Remön	Sweden	Karlskrona	N/A	Sweden	Minesweeper	5 None	No	No	No	No	No	No	No	No	No	No	1940	1966	1987	21 5
T121 Spica	Sweden	Stockholm	N/A	Sweden	Patrol Boat	6 None	No	No	No	No	No	No	No	No	No	No	1966	1987	1989	2 1
TV-253	Sweden	Göteborg	N/A	Sweden	Cutter	5 Yes	Yes	No	No	No	No	No	No	No	No	No	1960	1988	1990	2 1
Sail Training Ship Jarramas	Sweden	Karlskrona	N/A	Sweden	Sailing	8 None	No	No	No	No	No	No	No	No	No	No	1900	1950	1997	47 8
HMS Västervik	Sweden	Karlskrona	N/A	Sweden	Missile Boat	5 None	No	No	No	No	No	No	No	No	No	No	1975	1998	2000	2 1
T56	Sweden	Stockholm	N/A	Sweden	Patrol Boat	6 Yes	Yes	No	No	No	No	No	No	No	No	No	1957	1973	2003	30 6
HMS Hugin	Sweden	Göteborg	N/A	Sweden	Patrol Boat	6 None	No	No	No	No	No	No	No	No	No	No	1978	2001		
HMS Nordkapparen	Sweden	Göteborg	N/A	Sweden	Submarine	7 None	No	No	No	No	No	No	No	No	No	No	1962	1988		
HMS Solve	Sweden	Göteborg	N/A	Sweden	Monitor	5 None	No	No	No	No	No	No	No	No	No	No	1875	1919		
Taichin (USS Glendale)	United States	Nakhon Nayok	N/A	Thailand	Frigate	5 Yes	No	Yes	No	No	No	No	No	No	No	No	1943	2000	2001	1 1
Nurett (Nardim)	Turkey	Çanakkale	N/A	Turkey	Mineslayer	5 None	No	No	No	No	No	No	No	No	No	No	1913	1957	2003	46 8
Yanissar (P-113)	Cyprus	Gölaak	N/A	Turkey	Torpedo Boat	6 Yes	No	Yes	No	No	No	No	No	No	No	No				

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C and	Operational	Indoor	Raise	Wrecked	Disassembled	Marked for	HMSA	Core	Service Date	Decommission Date	Museum	Interpreted	Tiers
Gavry (USS Evercole)	United States	Izmit	N/A	Turkey	Destroyer	4	None	No	No	No	No	No	No	No	No	1946	1995	1997	2	1
TCG Ulusalreis (USS Thornback)	United States	Istanbul	N/A	Turkey	Submarine	7	None	No	No	No	No	No	No	Yes	No	1944	2000	2001	1	1
Zheleznikov	Russia	Kiev	N/A	Ukraine	Monitor	5	Yes	No	No	No	No	No	No	No	No	1936	1958	1965	7	2
M-296	Russia	Odesa	N/A	Ukraine	Submarine	7	Yes	No	Yes	No	No	No	No	No	No	1958	1980	1980	0	1
HMS Unicorn	United Kingdom	Dundee	N/A	United Kingdom	Sailing	8	None	No	No	No	No	No	No	Yes	Yes	1824	1968	1968	0	1
HMS Gannet	United Kingdom	Chatham	N/A	United Kingdom	Gunboat	5	None	No	No	No	No	No	No	Yes	Yes	1878	1968	1971	3	1
HMS Beibast	United Kingdom	London	N/A	United Kingdom	Cruiser	3	None	No	No	No	No	No	No	Yes	Yes	1939	1963	1971	8	2
Coastal Motor Boat 4	United Kingdom	Duxford	N/A	United Kingdom	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	Yes	1916		1972		
MTB-102	United Kingdom	Portsmouth	N/A	United Kingdom	Torpedo Boat	6	Yes	No	No	No	No	No	No	No	Yes	1937	1945	1973	28	6
HMS Warrior	United Kingdom	Portsmouth	N/A	United Kingdom	Sailing	8	None	No	No	No	No	No	No	Yes	Yes	1862	1924	1979	55	9
HMS Alliance	United Kingdom	Gosport	N/A	United Kingdom	Submarine	7	Yes	No	Yes	No	No	No	No	Yes	Yes	1947	1979	1981	2	1
Mary Rose	United Kingdom	Portsmouth	N/A	United Kingdom	Sailing	8	Yes	No	Yes	Yes	No	No	No	Yes	Yes	1511	1545	1982	437	10
M-33 (Minerva)	United Kingdom	Portsmouth	N/A	United Kingdom	Monitor	5	Yes	No	Yes	No	No	No	No	No	Yes	1915	1940	1987	47	8
HMS Plymouth	United Kingdom	Birkenhead	N/A	United Kingdom	Frigate	5	Yes	No	No	No	No	Yes	No	No	No	1961	1988	1990	2	1
HMS Trincamalee	United Kingdom	Hartlepool	N/A	United Kingdom	Sailing	8	None	No	No	No	No	No	No	No	Yes	1817	1857	1990	133	10
HMS Onyx	United Kingdom	Barrow-in-Furness	N/A	United Kingdom	Submarine	7	Yes	No	No	No	No	Yes	No	No	No	1967	1991	1992	1	1
HMS Ocelot	United Kingdom	Chatham	N/A	United Kingdom	Submarine	7	Yes	No	Yes	No	No	No	No	Yes	No	1964	1991	1992	1	1
MTB-71	United Kingdom	Portsmouth	N/A	United Kingdom	Torpedo Boat	6	Yes	No	Yes	No	No	No	No	No	No	1940	1944	1992	48	8
U-534	Germany	Birkenhead	N/A	United Kingdom	Submarine	7	Yes	No	Yes	No	Yes	No	No	No	No	1942	1945	1996	51	9
HSL-102	United Kingdom	Southampton	N/A	United Kingdom	Rescue Launch	10	Yes	No	No	No	No	No	No	Yes	Yes	1937	1946	1996	50	8
HMS Cwallier	United Kingdom	Chatham	N/A	United Kingdom	Destroyer	4	None	No	No	No	No	No	No	Yes	No	1944	1972	1998	26	6
Holland 1	United Kingdom	Gosport	N/A	United Kingdom	Submarine	7	Yes	No	Yes	Yes	No	No	No	Yes	Yes	1901	1913	2001	88	10
HMS Bonington	United Kingdom	Manchester	N/A	United Kingdom	Minesweeper	5	Yes	No	No	No	No	Yes	No	No	No	1953	1988	2002	14	3

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C. Opers. and	Indoo Base Dry	Indoo Base	Wreck	Disass. d	Mark ed for	HMSA Core	Service Date	Decom. Date	Interre grum.	Tiers
XE-8	United Kingdom	Chatham	N/A	United Kingdom	Submarine	7	Yes	Yes	Yes	No	No	No	No	No	1944	1952	
HMS Stickleback (X-51)	United Kingdom	Dunford	N/A	United Kingdom	Submarine	7	Yes	Yes	No	No	No	No	No	No	1954		
HMS X-24	United Kingdom	Goport	N/A	United Kingdom	Submarine	7	Yes	Yes	No	No	No	No	Yes	No	1943	1945	
HMS Victory	United Kingdom	Portsmouth	N/A	United Kingdom	Sailing	8	Yes	No	No	No	No	No	Yes	Yes	1778		0 1
USS Hornet	United States	Alameda	California	United States	Carrier	1	None	No	No	No	No	No	Yes	No	1943	1970	1998 28 6
USS Slater	United States	Albany	New York	United States	Destroyer	4	None	No	No	No	No	No	Yes	No	1944	1991	1997 6 2
USS Constellation	United States	Baltimore	Maryland	United States	Sailing	8	None	No	No	No	No	No	Yes	No	1855	1955	1955 0 1
USS Torsk	United States	Baltimore	Maryland	United States	Submarine	7	None	No	No	No	No	No	Yes	No	1944	1968	1972 4 1
USCGC Taney	United States	Baltimore	Maryland	United States	Cutter	5	None	No	No	No	No	No	Yes	No	1936	1986	1986 0 1
SS John W. Brown	United States	Baltimore	Maryland	United States	Transport	10	Yes	No	No	No	No	No	Yes	No	1942	1946	1988 42 8
USS Kidd	United States	Baton Rouge	Louisiana	United States	Destroyer	4	None	No	No	No	No	No	Yes	No	1943	1964	1982 18 4
PACV-4	United States	Bellingham	Washington	United States	Hovercraft	6	Yes	Yes	No	No	No	No	Yes	No	1965		
PBR Mark II	United States	Bellingham	Washington	United States	Patrol Boat	6	Yes	Yes	No	No	No	No	Yes	No			
USS Constitution	United States	Boston	Massachusetts	United States	Sailing	8	Yes	No	No	No	No	No	Yes	No	1797	1881	1887 16 4
USS Cassin Young	United States	Boston	Massachusetts	United States	Destroyer	4	None	No	No	No	No	No	Yes	No	1943	1960	1978 18 4
USS Lucid	United States	Bradford Island	California	United States	Minesweeper	5	None	No	No	No	No	No	Yes	No	1955	1976	2005 29 6
USS Turner Joy	United States	Bremerton	Washington	United States	Destroyer	4	None	No	No	No	No	No	Yes	No	1959	1982	1991 9 2
USS Aries	United States	Brunswick	Missouri	United States	Missile Boat	5	None	No	No	No	No	No	Yes	No	1982	1993	2002 9 2
USS Croaker	United States	Buffalo	New York	United States	Submarine	7	None	No	No	No	No	No	Yes	No	1944	1968	1976 8 2
USS Little Rock	United States	Buffalo	New York	United States	Cruiser	3	None	No	No	No	No	No	Yes	No	1945	1976	1977 1 1
USS The Sullivans	United States	Buffalo	New York	United States	Destroyer	4	None	No	No	No	No	No	Yes	No	1943	1965	1977 12 3
PTF 17	United States	Buffalo	New York	United States	Patrol Boat	6	Yes	Yes	No	No	No	No	Yes	No	1968	1976	1979 3 1
USS New Jersey	United States	Camden	New Jersey	United States	Battleship	2	None	No	No	No	No	No	Yes	No	1943	1991	2001 10 2
H.L. Hunley	United States	Charleston	South Carolina	United States	Submarine	7	Yes	Yes	Yes	No	No	No	Yes	No	1863	1864	2000 136 10
U-505 (German)	Germany	Chicago	Illinois	United States	Submarine	7	Yes	No	Yes	No	No	No	Yes	No	1941	1944	1954 10 2
USS Coad	United States	Cleveland	Ohio	United States	Submarine	7	None	No	No	No	No	No	Yes	No	1943	1946	1975 29 6
CSS Jackson	Confederate	Columbus	Georgia	United States	Ironclad	5	Yes	No	Yes	Yes	No	No	Yes	No	1864	1865	1963 98 10
CSS Chattahoochee	Confederate	Columbus	Georgia	United States	Ironclad	5	Yes	No	Yes	Yes	No	No	Yes	No	1863	1865	1964 99 10
USS Lexington	United States	Corpus Christi	Texas	United States	Carrier	1	None	No	No	No	No	No	Yes	No	1943	1991	1992 1 1

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C and	Operational	Indoor	Raise	Wreck	Disassembled	Marked for	HMSA	Core	Service Date	Decommission Date	Museum	Interpreted	Tiers	
PT 3	United States	Deland	Florida	United States	Patrol Boat	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1963	1977	2003	26	6
US Brig Niagara	United States	Erie	Pennsylvania	United States	Sailing	8 Yes	8 Yes	No	No	No	No	No	No	No	No	No	1990	1820	1990	170	10
LC(L)-1091	United States	Eureka	California	United States	Landing Craft	6 None	6 None	No	No	No	No	No	No	No	No	No	1944	1955	2005	50	8
USS LST-325	United States	Evanville	Indiana	United States	Landing Craft	6 None	6 None	No	No	No	No	No	No	No	No	No	1943	2000	2005	5	1
USS Massachusetts	United States	Fall River	Massachusetts	United States	Battleship	2 None	2 None	No	No	No	No	No	No	No	No	No	1942	1947	1965	18	4
Demolition Boat	Japan	Fall River	Massachusetts	United States	Suicide Boat	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1945	1973	28	6	6
USS Uonifish	United States	Fall River	Massachusetts	United States	Submarine	7 None	7 None	No	No	No	No	No	No	No	No	No	1944	1953	1973	20	4
USS Joseph P. Kennedy, Jr	United States	Fall River	Massachusetts	United States	Destroyer	4 None	4 None	No	No	No	No	No	No	No	No	No	1945	1973	1974	1	1
PT 796	United States	Fall River	Massachusetts	United States	Patrol Boat	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1945	1970	1975	5	1
PT 617	United States	Fall River	Massachusetts	United States	Patrol Boat	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1945	1945	1985	40	7
Hidensee	Germany (East)	Fall River	Massachusetts	United States	Missile Boat	5 None	5 None	No	No	No	No	No	No	No	No	No	1985	1996	1997	1	1
LCM 56	United States	Fall River	Massachusetts	United States	Landing Craft	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1952				
Minesweeper MSB-5	United States	Fort Worth	Texas	United States	Minesweeper	5 Yes	5 Yes	No	No	No	No	No	No	No	No	No	1938	1941	1942	1	1
HA-19 (Japanese)	Japan	Fredericksburg	Texas	United States	Submarine	7 Yes	7 Yes	No	No	No	No	No	No	No	No	No	1944	1945	1994	49	8
PT 309	United States	Fredericksburg	Texas	United States	Patrol Boat	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1944	1945	1994	49	8
USS Cavalla	United States	Galveston	Texas	United States	Submarine	7 Yes	7 Yes	No	No	No	No	No	No	No	No	No	1943	1968	1971	3	1
USS Stewart	United States	Galveston	Texas	United States	Destroyer	4 Yes	4 Yes	No	No	No	No	No	No	No	No	No	1943	1945	1974	29	6
HA-8 (Japanese)	Japan	Groton	Connecticut	United States	Submarine	7 Yes	7 Yes	No	No	No	No	No	No	No	No	No	1943	1943	1943	0	1
USS Nautilus	United States	Groton	Connecticut	United States	Submarine	7 None	7 None	No	No	No	No	No	No	No	No	No	1954	1980	1986	6	2
Siluro San Bartolomeo	Italy	Groton	Connecticut	United States	Manned Torp.	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1943	1943			
USS Ung	United States	Hackensack	New Jersey	United States	Submarine	7 None	7 None	No	No	No	No	No	No	No	No	No	1945	1946	1973	27	6
PBR Mark II	United States	Hackensack	New Jersey	United States	Patrol Boat	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1944	1945			
Kaiten	Japan	Hackensack	New Jersey	United States	Manned Torp.	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1944	1945			
Seehund (German)	Germany	Hackensack	New Jersey	United States	Submarine	7 Yes	7 Yes	No	No	No	No	No	No	No	No	No	1916	1941	1941	0	1
USS Arizona	United States	Honolulu	Hawaii	United States	Battleship	2 Yes	2 Yes	No	No	No	Yes	No	No	No	No	No	1911	1941	1941	0	1
USS Utah	United States	Honolulu	Hawaii	United States	Battleship	2 Yes	2 Yes	No	No	No	Yes	No	No	No	No	No	1911	1941	1941	0	1
USS Bowfin	United States	Honolulu	Hawaii	United States	Submarine	7 None	7 None	No	No	No	No	No	No	No	No	No	1942	1971	1981	10	2
USS Missouri	United States	Honolulu	Hawaii	United States	Battleship	2 None	2 None	No	No	No	No	No	No	No	No	No	1944	1992	1998	1	1
Kaiten	Japan	Honolulu	Hawaii	United States	Manned Torp.	6 Yes	6 Yes	No	No	No	No	No	No	No	No	No	1944	1945			
USCG Mohawk	United States	Key West	Florida	United States	Cutter	5 None	5 None	No	No	No	No	No	No	No	No	No	1935	1948	1948	0	1

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C and	Operational	Dry Dock	Indoor	Raise	Wrecked	Disassembled	Marked	HMSA	Core	Service Date	Decommission Date	Museum	Interpretive	Tiers
USCGC Ingham	United States	Key West	Florida	United States	Cutter	5 None	No	No	No	No	No	No	No	No	No	No	1936	1988	1989	1	1
PT 615	United States	Kingston	New York	United States	Patrol Boat	6 Yes	Yes	No	No	No	No	No	No	No	Yes	No	1945	1946			
PT 728	United States	Kingston	New York	United States	Patrol Boat	6 Yes	Yes	No	No	No	No	No	No	No	Yes	No	1945	1945			
CSS Neuse	Confederate	Kinston	North Carolina	United States	Ironclad	5 Yes	No	Yes	No	No	Yes	No	No	No	No	No	1864	1865	1963	98	10
USS Orleck	United States	Lake Charles	Louisiana	United States	Destroyer	4 None	No	No	No	No	No	No	No	No	Yes	No	1945	2000	2000	0	1
USS Texas	United States	LaPorte	Texas	United States	Battleship	2 None	No	No	No	No	No	No	No	No	Yes	No	1914	1948	1948	0	1
Scorpion (B-427)	Russia	Long Beach	California	United States	Submarine	7 None	No	No	No	No	No	No	No	No	No	No	1972	1994	1995	1	1
USS Cobla	United States	Manitowoc	Wisconsin	United States	Submarine	7 None	No	No	No	No	No	No	No	No	Yes	No	1944	1954	1970	16	4
USS Alabama	United States	Mobile	Alabama	United States	Battleship	2 None	No	No	No	No	No	No	No	No	Yes	No	1942	1947	1964	17	4
USS Drum	United States	Mobile	Alabama	United States	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	Yes	No	1941	1947	1969	22	5
PBR Mark II	United States	Mobile	Alabama	United States	Patrol Boat	6 Yes	No	Yes	No	No	No	No	No	No	Yes	No	1943	1970	1975	5	1
USS Yorktown	United States	Mt. Pleasant	South Carolina	United States	Carrier	1 None	No	No	No	No	No	No	No	No	Yes	No	1945	1973	1981	8	2
USS Chamagore	United States	Mt. Pleasant	South Carolina	United States	Submarine	7 None	No	No	No	No	No	No	No	No	Yes	No	1945	1975	1981	6	2
USS Laffey	United States	Mt. Pleasant	South Carolina	United States	Destroyer	4 None	No	No	No	No	No	No	No	No	Yes	No	1941	1946	1973	27	6
USS Silverides	United States	Muskegon	Michigan	United States	Submarine	7 None	No	No	No	No	No	No	No	No	Yes	No	1927	1969	1993	24	5
USCGC McLane	United States	Muskegon	Michigan	United States	Cutter	5 None	No	No	No	No	No	No	No	No	Yes	No	1942	1946	2002	56	9
USS LST-393	United States	Muskegon	Michigan	United States	Landing Craft	6 None	No	No	No	No	No	No	No	No	Yes	No	1943	1969	1972	3	1
USS Batfish	United States	Muskogee	Oklahoma	United States	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	Yes	No	1936			0	1
USCGC Eagle	United States	New London	Connecticut	United States	Sailing	8 Yes	Yes	No	No	No	No	No	No	No	Yes	No	1936				
LQVP	United States	New Orleans	Louisiana	United States	Landing Craft	6 Yes	No	Yes	No	No	No	No	No	No	No	No	1943	1974	1982	8	2
USS Intrepid	United States	New York	New York	United States	Carrier	1 None	No	No	No	No	No	No	No	No	Yes	No	1958	1964	1988	24	5
USS Growler	United States	New York	New York	United States	Submarine	7 None	No	No	No	No	No	No	No	No	Yes	No	1862	1862	2002	140	10
USS Monitor	United States	Newport News	Virginia	United States	Ironclad	5 Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	1862	1862	2002	140	10
USS Wisconsin	United States	Norfolk	Virginia	United States	Battleship	2 None	No	No	No	No	No	No	No	No	Yes	No	1944	1991	2001	10	2
USS Razorback	United States	North Little Rock	Arkansas	United States	Submarine	7 None	No	No	No	No	No	No	No	No	Yes	No	1944	2001	2005	4	1
USS Hazard	United States	Omaha	Nebraska	United States	Minesweeper	5 Yes	No	Yes	No	No	No	No	No	No	Yes	No	1944	1946	1971	25	5
USS Madrin	United States	Omaha	Nebraska	United States	Submarine	7 Yes	No	Yes	No	No	No	No	No	No	Yes	No	1953	1973	1974	1	1
PBR Mark II	United States	Orlando	Florida	United States	Patrol Boat	6 Yes	No	Yes	No	No	No	No	No	No	Yes	No	1885	1922	1957	35	7
USS Olympia	United States	Philadelphia	Pennsylvania	United States	Cruiser	3 Yes	No	No	No	No	No	No	No	Yes	Yes	No	1944	1969	1976	7	2
USS Becuna	United States	Philadelphia	Pennsylvania	United States	Submarine	7 None	No	No	No	No	No	No	No	No	Yes	No	1944	1969	1976	7	2

Vessel	Nationality	City	State	Country	Vessel Classification	VCN	Spec.C and	Operational Dry	Indoo Base	Wreck	Disass	Mark	Service	Decom	Interre			
							VCN	Operational Dry	Indoo Base	Wreck	Disass	Mark	Service	Decom	Interre			
													Date	Date	gnum	Tiers		
USS Edson	United States	Philadelphia	Pennsylvania	United States	Destroyer	4	Yes	No	No	No	No	Yes	No	1958	1988	2004	16	4
USS Requin	United States	Pittsburgh	Pennsylvania	United States	Submarine	7	None	No	No	No	No	No	Yes	1945	1968	1972	4	1
USS Blueback	United States	Portland	Oregon	United States	Submarine	7	None	No	No	No	No	No	Yes	1959	1990	1994	4	1
PT 658	United States	Portland	Oregon	United States	Patrol Boat	6	Yes	No	No	No	No	No	Yes	1945	1948	1994	46	8
LCI(L)-1713	United States	Portland	Oregon	United States	Landing Craft	6	None	No	No	No	No	No	Yes	1944	1946	2003	57	9
USS Albacore	United States	Portsmouth	New Hampshire	United States	Submarine	7	Yes	No	No	No	No	No	Yes	1953	1972	1984	12	3
USS Salem	United States	Quincy	Massachusetts	United States	Cruiser	3	None	No	No	No	No	No	Yes	1949	1991	1994	3	1
Seehund (German)(U-5075)	Germany	Quincy	Massachusetts	United States	Submarine	7	Yes	No	No	No	No	No	Yes	1945				
SS Red Oak Victory	United States	Richmond	California	United States	Transport	10	None	No	No	No	No	No	Yes	1944	1946	1998	52	9
CCB-18	United States	Rio Vista	California	United States	Gunboat	5	Yes	No	No	No	No	No	No	1969		2000		
PT 26	United States	Rio Vista	California	United States	Patrol Boat	6	Yes	No	No	No	No	No	Yes	1968	1990	2000	10	2
USS Midway	United States	San Diego	California	United States	Carrier	1	None	No	No	No	No	No	Yes	1945	1992	2004	12	3
USS Dolphin	United States	San Diego	California	United States	Submarine	7	None	No	No	No	No	No	Yes	1968	2006	2008	2	1
B-39 (Soviet)	Russia	San Diego	California	United States	Submarine	7	None	No	No	No	No	No	Yes	1967	1994	2005	11	3
USS Pampanito	United States	San Francisco	California	United States	Submarine	7	None	No	No	No	No	No	Yes	1943	1971	1975	4	1
SS Jeremiah O'Brien	United States	San Francisco	California	United States	Transport	10	Yes	No	No	No	No	No	Yes	1943	1946	1979	33	7
SS Lane Victory	United States	San Pedro	California	United States	Transport	10	Yes	No	No	No	No	No	Yes	1945	1970	1988	18	4
SS American Victory	United States	Tampa	Florida	United States	Transport	10	Yes	No	No	No	No	No	Yes	1945	1969	1999	30	6
U-484 (K-77)	Russia	Tampa	Florida	United States	Submarine	7	None	No	No	No	No	Yes	No	1965	1994	2002	8	2
LCS(L)-102	United States	Vallejo	California	United States	Landing Craft	6	None	No	No	No	No	No	Yes	1945	2007	2007	0	1
PBR Mark II	United States	Vallejo	California	United States	Patrol Boat	6	Yes	No	No	No	No	No	Yes					
USS Cairo	United States	Vicksburg	Mississippi	United States	Ironclad	5	None	No	Yes	Yes	No	No	Yes	1862	1862	1977	115	10
Gunboat Philadelphia	United States	Washington	Dist. Of Columbia	United States	Sailing	8	Yes	No	Yes	Yes	No	No	Yes	1776	1776	1935	159	10
USS Barry	United States	Washington	Dist. Of Columbia	United States	Destroyer	4	None	No	No	No	No	No	Yes	1956	1982	1984	2	1
LOVP	United States	Washington	Dist. Of Columbia	United States	Landing Craft	6	Yes	No	Yes	No	No	No	Yes					
PCF-1	United States	Washington	Dist. Of Columbia	United States	Patrol Boat	6	Yes	No	Yes	No	No	No	Yes	1965				
USS North Carolina	United States	Wilmington	North Carolina	United States	Battleship	2	None	No	No	No	No	No	Yes	1941	1947	1961	14	3