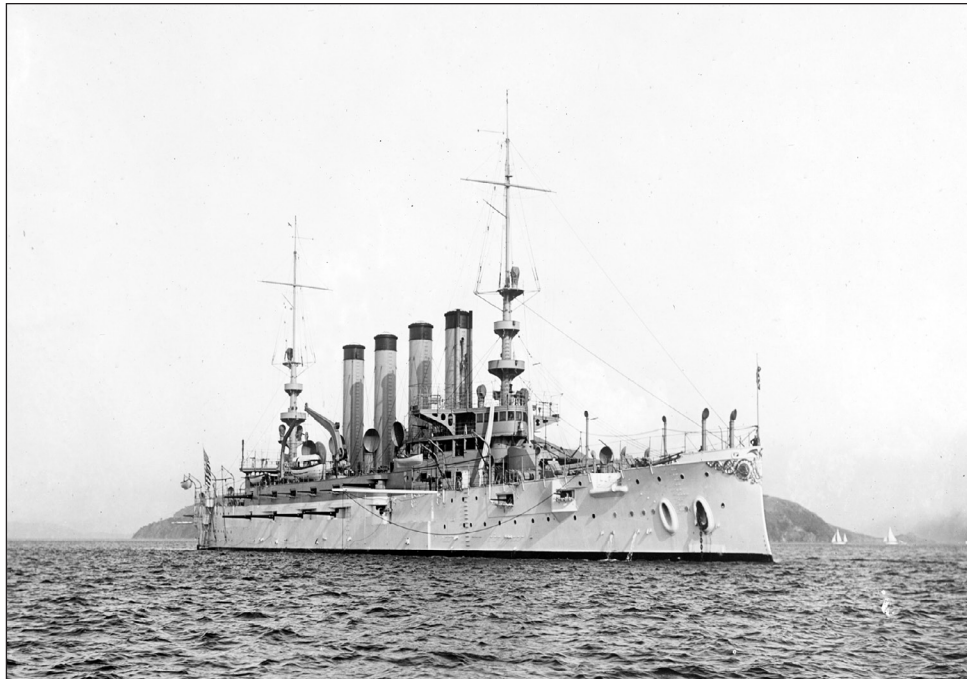


USS *SAN DIEGO* 2017 SURVEY

FIELD REPORT



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A
Technical Report
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Cover Photo: USS *California* [USS *San Diego*] 1907. Courtesy of the Library of Congress [LC-DIG-npcc-32729u].

EXECUTIVE SUMMARY

Between 10-15 September 2017, the Naval History and Heritage Command (NHHC), the University of Delaware (UD), the Naval Surface Warfare Center Carderock Division (NSWCC), the Office of Naval Intelligence (ONI), and the U.S. Naval Academy (USNA) partnered to conduct a remote sensing documentation survey of World War I-era armored cruiser USS *San Diego*. The survey obtained acoustic and video data that will be utilized to better understand the wreck site's present condition and assist in the commemoration of the loss of *San Diego* and the U.S. Navy's role in World War I upon the centennial anniversary of the vessel's sinking in July 2018. The project was supported by the U.S. Coast Guard (USCG), which graciously permitted their facility at Station Fire Island to serve as a base of operations.

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CONTENTS

Executive Summary	i
Acknowledgments.....	i
Figures	iv
Tables	iv
I. Introduction.....	1
Project Objectives.....	1
Summary of Operations.....	1
II. Historical Background & Past Investigation	1
The <i>Pennsylvania</i> -class Armored Cruisers	1
The Operational History of USS <i>San Diego</i> , 1904–1918	3
The Aftermath of the Loss of USS <i>San Diego</i>	6
A Mine, Torpedo, or Sabotage?.....	8
Revived Interest in USS <i>San Diego</i>	9
Recreational Diving and the USS <i>San Diego</i> Site	11
The U.S. Navy Returns to the USS <i>San Diego</i> Site: The 1995 Site Assessment	11
Undersea Adventures, Inc. v USS <i>San Diego</i> : The Saga Continues	13
Nomination of USS <i>San Diego</i> to the National Register of Historic Places	14
Recent Operations (2016–2017): Planning for the Centennial Commemoration.....	14
III. Geographical and Environmental Parameters.....	15
IV. Scientific Field Methods & Account of Operation.....	22
Partners & Funding Sources.....	22
Personnel	22
Platform.....	22
Methods & Tools	23
Operations.....	23
Site Restoration	27
V. Conservation & Curation	27
VI. Project Outreach Products.....	27
Completed outreach products	27
Anticipated outreach products	28
VII. Permitting Requirements	28
VIII. Conclusions & Recommendations.....	28
IX. References Cited	29
Appendix A: Excerpt from the Court of Inquiry	33
Appendix B: Selected Ship Plans.....	36
Appendix C: Log of Operations	40
Appendix D: Media Clips	44

FIGURES

Figure 1.	USS <i>San Diego</i> in 1915 while serving as flagship of the Pacific Fleet	2
Figure 2.	USS <i>San Diego</i> sinking off Fire Island, New York.	6
Figure 3.	Side-scan sonar data collected along port side of USS <i>San Diego</i> in 2017.	14
Figure 4.	Side-scan sonar data collected along starboard side of USS <i>San Diego</i>	15
Figure 5.	Map of Long Island, NY, showing survey area	16
Figure 6.	Approximate location of USS <i>San Diego</i>	16
Figure 7.	Satellite image of U.S. Coast Guard Station Fire Island	17
Figure 8.	Hydrographic survey soundings (in feet) collected by NOAA in 1973.	17
Figure 9.	Multibeam bathymetry data collected in 1998 by the USGS	18
Figure 10.	Compilation of grain-size data provided by the USGS	19
Figure 11.	Seafloor classification data published by the usSEABED	19
Figure 12.	Weather almanac for the month of September in Islip, NY.	20
Figure 13.	Monthly temperature and precipitation normals (1981-2010) for Islip, NY.	20
Figure 14.	Significant wave height between 04/1991 and 12/2008	21
Figure 15.	Wind speed between 10/1975 and 12/2008.	21
Figure 16.	HURDAT plot of tropical storms and hurricanes for the period 1851–2013	21
Figure 17.	Research vessel <i>Joanne Daiber</i> with the Edgetech 6205 sensor	23
Figure 18.	GAVIA Autonomous Underwater Vehicle	23
Figure 19.	Outland 1000 Remotely Operated Vehicle.	23
Figure 20.	Dr. Alexis Catsambis examines bathymetry and side-scan sonar data	24
Figure 21.	Bathymetric data in the form of a three-dimensional point cloud.	24
Figure 22.	Sample AUV mission navigation lanes as planned (left) and as executed (right)	24
Figure 23.	ROV control environment	25
Figure 24.	Multibeam data collected over the port stern quarter of USS <i>San Diego</i>	25
Figure 25.	AUV deployment operations as captured by aerial drone.	26
Figure 26.	Dr. Art Trembanis providing briefing personnel on the capabilities of the AUV	26
Figure 27.	Dr. Alexis Catsambis being interviewed by the <i>San Diego Union-Tribune</i>	27

TABLES

Table 1.	Research team supporting the September 2017 <i>USS San Diego</i> field survey	22
Table 2.	Summary of operations during the 2017 <i>USS San Diego</i> field survey.	26

I. INTRODUCTION

San Diego is the only major warship lost by the U.S. Navy during the Great War; it is also, however, the location of the sinking that has brought the site to particular prominence. On 19 July 1918, only a few miles south of Fire Island, NY, *San Diego* suffered a fatal blow at the hands of German submarine *U-156* as a result of a reported external explosion. Six sailors perished in the attack and the capsized hull now rests within recreational diving depths. Continued unauthorized disturbance of the site, evidence of exposed unexploded ordnance, and the upcoming centennial commemoration of the ship's loss in 2018 led the NHHHC to plan for a return to *San Diego* after a hiatus of two decades. The site has been deemed to meet all the requirements for a sunken military craft under the management of the NHHHC, and was also placed on the National Register of Historic Places (NRHP) in 1998.

Project Objectives

The four primary objectives of the 2017 USS *San Diego* Survey mission were to: A) document and assess the condition of USS *San Diego* and its surrounding environment to inform a site management plan; B) determine, if feasible, the cause and circumstances of the vessel's sinking; C) serve as a training mission on the use of advanced data collection and analysis techniques to interpret a century-old combat loss; and D) develop products through which to commemorate the loss of *San Diego* and the U.S. Navy's participation in World War I. The overall mission is undertaken for archaeological, historical, and educational outcomes.

The key internal NHHHC partners in this effort are the Underwater Archaeology Branch, the Histories Branch, and the Communication Branch, with each providing their respective area of expertise. The UD Coastal Sediments Hydrodynamics & Engineering Laboratory serves as the key external partner, contributing hydrographic expertise, remote sensing instruments, and the research platform R/V *Joanne Daiber*. Additional project partners include the NSWCC Hull Response and Protection Branch, which will evaluate recovered data in an attempt to empirically assess the sinking processes associated with USS *San Diego*, and the ONI Farragut Technical Analysis Center, which will support data visualization efforts in the post-processing phase. Finally the USNA Oceanography Department enabled the field participation of a midshipman, who also effectively supported outreach efforts. The USCG Station Fire Island afforded the project logistical assistance and allowed R/V *Joanne Daiber* to use the Station as a base of field operations.

Summary of Operations

Field operations were conducted between 10 and 15 September, 2017, with 10 September and 15 September serving as mobilization and demobilization days respectively. The first day of surveying, 11 September, was dedicated to eight Autonomous Underwater Vehicle (AUV) acoustic survey missions. The second day, 12 September, was dedicated to a Remotely Operated Vehicle (ROV) mission and technical equipment repairs. The third day, 13 September, was dedicated to collecting acoustic data from a surface survey consisting of 15 survey lanes, along with two additional AUV missions. The last day of operations, 14 September, was dedicated to data processing and exchange, along with a demonstration mission for the USCG Station Fire Island. In all, more than 80 GB of data were collected during the course of operations over the site of USS *San Diego* resulting in excellent acoustic data coverage. Poor underwater visibility, however, limited the effectiveness of the visual data collected.

II. HISTORICAL BACKGROUND & PAST INVESTIGATION

by Chris Martin and Alexis Catsambis

The Pennsylvania-class Armored Cruisers

The Treaty of Paris that ended the Spanish-American War on 10 December 1898 catapulted the United States into the role of a global colonial power. The treaty gave the United States control of Puerto Rico, Guam, and the Philippines, conferring new responsibilities on the United States Navy. Secretary of the Navy John Davis Long realized that the Navy needed to be able to control the sea lanes between the mainland United States and the Far East and called for the building of 12,000-ton armored cruisers with a "much increased steaming endurance" over Admiral of the Navy George Dewey's flagship, the protected cruiser *Olympia*. While the Navy officially designated the ships cruisers, it envisioned their role as a "fast battleship." In a meeting with the Board on Construction, the chief of the Bureau of Equipment, Rear Admiral Royal Bird Bradford, remarked that the new cruisers, "should be ready to fight almost anything, even a battleship" (Friedman 1984:45). Furthermore, Captain Charles Dwight Sigsbee of the Office of Naval Intelligence stated, "the aim is to get these armored cruisers in the battle line" (Friedman 1984:54). According to historian Norman Friedman, "the development of



Figure 1. USS San Diego photographed on 28 January 1915 while serving as flagship of the Pacific Fleet. (U.S. Naval History and Heritage Command Photograph #NH 92175.)

lightweight steel armor in the 1890s...made it possible to build large warships with adequate protection that traded firepower for speed.” In any fleet engagement, the American fleet commander obviously needed to know the location of the enemy fleet. Armored cruisers were well suited for this role because of their speed. While the armored cruisers were not as well armed as battleships, “a fast division of heavy ships still offered the possibility of catching up and slowing the enemy enough for the main fleet to arrive” (Friedman 2015:16-23).

The Navy publicly reinforced their view of armored cruisers as nearly equivalent to battleships by giving the armored cruisers the names of states rather than cities (Friedman, 1984:45). According to an act of Congress passed 12 June 1858, ships of the “first class” with 40 guns or more would receive the names of states, while ships of the “second class” with less than 40 guns, but more than 20 guns, would be named after major cities and rivers (NHHC 2015). Based upon that law, all ten armored cruisers eventually built between the *Pennsylvania* and *Tennessee* classes should have been named after cities.

Three major shipyards, William Cramp & Sons in Philadelphia, Pennsylvania, Newport News Shipbuilding in Newport News, Virginia, and Union Iron Works in San Francisco, California, laid the keels for the six *Pennsylvania*-class armored cruisers between August 1902 and September 1902. Each ship class is named for the first ship in that class to be authorized

by Congress. The first armored cruiser authorized by Congress in 1900 was USS *Pennsylvania* (Armored Cruiser No. 4); therefore, the class took her name. Coincidentally, *Pennsylvania* also became the first armored cruiser launched when she entered the Delaware River alongside the William Cramp & Sons Shipyard in Philadelphia in August 1903. In an example of how quickly military technology changed in the first decade of the 20th century, while most of the *Pennsylvania*-class armored cruisers were under construction, the dramatic increase in battleship speed caused by the invention of the steam turbine, along with events on the other side of the world, pushed the armored cruisers into a new role (Friedman 2015:16–23).

In 1904, the Bureau of Navigation (BUNAV) issued a report on the Russo-Japanese War that changed U.S. Navy leadership’s view on the utility of the armored cruisers. According to BUNAV, in the conflict, “the work of the armored cruisers was auxiliary to that of the battleships, and indeed during the whole war they have been used in an auxiliary capacity.” According to Friedman, the Russo-Japanese War “had shown that no ship with guns of less than battleship caliber could claim capital status.” At the same time, the war showed that existing scout and protected cruisers like *Olympia* were no longer suitable to serve as scouts, opening up this role to the new *Pennsylvania*-class armored cruisers (Friedman 1984:57). This role defined *San Diego*’s service prior to the American entry into World War I in 1917.

The Operational History of USS San Diego, 1904–1918

San Diego began her duty with the fleet as the armored cruiser *California* on 7 May 1902 (Figure 1). Built by the Union Iron Works, at a cost of \$3.8 million, the Navy launched *California* on 28 April 1904, sponsored by Florence Pardee, daughter of California governor George C. Pardee. The ship would bear the name of the 31st state of the union until September 1914, when she was re-named *San Diego* in order to allow the Navy to name its newest battleship, BB-44, *California* (U.S. Navy, n.d.:1). When she launched as the third ship in the *Pennsylvania* class, *California* weighed 13,680 tons, was 503 ft. 11 in. long (153.59 m), with a breadth at the water line of 69 ft. 6 in. (21.18 m) and mean draft of 24 ft. 1 in. (7.34 m). *California*'s armament consisted of four 8"/45 caliber breach loading rifles (BLR), fourteen 6"/50 caliber BLRs, eighteen 3"/50 caliber rapid-fire guns, four three-pounder saluting guns and two 18" torpedo tubes (U.S. Navy 1924:1).

Commissioned on 1 August 1907 with Captain Thomas Stowell Phelps, Jr. in command, *California*'s maiden voyage took her to Puget Sound, Victoria, Canada, San Francisco, and Magdalena Bay, Mexico. In early 1908, she steamed to San Diego to participate in the unveiling of a memorial dedicated to the gunboat *Bennington* (Gunboat No. 4), whose boiler exploded in San Diego Harbor 21 July 1905. Afterward, *California* returned to San Francisco to complete sea trials and undergo repairs (Hasson 1957:1).

Assigned to the 2nd Division of the U.S. Pacific Fleet, *California* participated in the naval review by Secretary of the Navy Victor H. Metcalf (December 1906–November 1908) at San Francisco in May 1908. In August, she conducted port visits to Honolulu, Hawaii, and Samoa. Thereafter she participated in exercises off the west coast of the United States until departing San Francisco once more for Hawaii on 21 November 1911. Arriving off the coast of Honolulu a week later on 28 November, *California* became the first "man of war" to transverse the newly dredged channel, entering Pearl Harbor on 14 December (Naval History and Heritage Command, n.d.:1).

California remained in Hawaii until March 1912, when she was assigned to duty on Asiatic Station and visited the Philippines, China, and Japan. After serving just a few months on Asiatic Station, the Navy ordered *California* to steam to Corinto, Nicaragua, to deploy a landing force ordered to protect American interests during political upheaval in that country (Nalty 1968:7-10; Heintz 1991:169). Returning to the west coast of the United States in October 1912, *California* spent 1913 and early 1914 on duty off the coast of California (Naval History and Heritage Command, n.d.:1).

In early 1914, *California* made two cruises that

illustrate her role as a scout. On both cruises, the first 21 April to 24 June 1914, and the second, 16 July to 18 August, the Navy ordered *California* "to observe conditions" along the coast of Mexico during the Tampico Affair and the resulting American occupation of Veracruz (Naval History and Heritage Command, n.d.:1).

As the Navy no longer expected the armored cruisers to fight as part of the main American battle line, it renamed all of the ships in the *Pennsylvania* class beginning in 1912. Re-named *San Diego* on 1 September 1914, she became flagship of the Pacific Fleet. As flagship, she participated in the opening of the Panama-California Exposition on 1 January 1915. A few weeks later on 21 January, the ship suffered an explosion in the No. 1 fire room, killing five sailors and injuring seven more. Ensign Robert Webster Cary, Jr. earned the Medal of Honor for holding the watertight doors between the ship's fire rooms open, allowing three of his shipmates to escape (Congressional Medal of Honor Society 2016a). Fireman Second Class Telesforo Trinidad also earned the Medal of Honor for his actions that day. Blown clear of Boiler Room No. 2, Trinidad immediately returned and brought injured Fireman Second Class R.E. Daly out to safety. Just after Trinidad and Daly exited the No. 2 fireroom, an explosion occurred in the No. 3 fireroom, burning Trinidad's face. After passing the injured Daly on to another bluejacket, Trinidad entered the No. 3 fireroom and successfully rescued a second injured Sailor (Congressional Medal of Honor Society 2016b).

Given the damage caused by the explosion, the Navy placed *San Diego* on limited commission from 10 June to 15 September 1915 pending repairs. Rejoining the Pacific Fleet in late 1915, *San Diego* participated in the successful rescue of 48 passengers from the schooner SS *Fort Bragg*, which wrecked on a reef 20 nautical miles (nm) northeast of Cabo San Lucas, Mexico, on 13 November 1915 (*Mariposa Gazette* 1915:2).

In early 1917, the Navy ordered *San Diego* to return to Mare Island where she was placed in reserve on 12 February 1917 pending repairs. She was still undergoing repairs when the United States declared war on Germany on 6 April 1917 and, like much of the rest of the American military establishment, was not yet ready to fight.

In the nearly 100 years since the end of World War I, historians have debated the overall readiness of the U.S. Navy in 1917 and reached nuanced conclusions (Herring, Jr. 1964; Thelander 1966; Still, Jr. 2006:4–5; Conrad 2016). Both Secretary of the Navy Josephus Daniels (March 1913–March 1921) and the Chief of Naval Operations (CNO) Admiral William S. Benson (May 1915–September 1919) believed as early as 1915 that the United States would eventually be compelled

to enter the conflict raging in Europe. According to Benson, soon after taking office as the Navy's first CNO in May 1915, he ordered every Bureau and office in the Department of the Navy "to report not later than a certain date its preparedness for war, and state in particular where it was not prepared and what efforts were being made to make up the deficiency" (Still, Jr. 2006:4). Benson received the first of these reports in late June (Bradford, 1990:306).

This preparedness effort gained presidential sanction in July 1915 when Wilson ordered Daniels and Secretary of War Lindley M. Garrison to "prepare programs that assured reasonable security" (Still, Jr. 2006:4). In 1916, the Bureau of Supplies and Accounts began the purchase of "such quantities of provisions, clothing and general stores as may be necessary" as well as to fully fill all the coaling stations on the Atlantic coast (Still, Jr. 2006:4-5). The Navy's logistical preparedness campaign was so successful that following the United States declaration of war against Germany on 6 April 1917, President Woodrow Wilson summoned Assistant Secretary of the Navy Franklin D. Roosevelt (March 1913-August 1920) to the White House and told him that the Navy had "cornered the market in a great many essential supplies and you have to give up 50% of it to the Army" (Still, Jr., 2006:5).

Despite the apparent success of the industrial and logistical preparedness campaign, the fleet was not prepared to fight the kind of conflict it faced in 1917. The 1916 Naval Act passed by Congress appropriated money to build 156 ships, including 10 battleships, preparing the Navy to eventually fight a Mahanian battleship-on-battleship engagement with a foreign navy. However, the Navy was woefully under-prepared to fight the anti-submarine warfare campaign that it faced in 1917. After the American entry into the war, Daniels quickly regretted the Navy's heavy focus on battleship construction and wrote in his diary, "Oh for more destroyers! I wish we could trade the money in dreadnoughts for destroyers already built" (Still, Jr. 2006:6). Benson's decision to place armed guards aboard merchant ships further affected the fleet's readiness. According to historian William N. Still, Jr., "although the first warships to sail for European waters had full complements, not more than ten percent of the ships were fully manned" for war in April 1917 (Still, Jr. 2006:7).

San Diego played an important role in preparing the Navy to fight even while undergoing repairs at Mare Island. After the declaration of war, the Navy chose to use *San Diego*, along with two other vessels, the battleship *Oregon* (Battleship No. 3) and another armored cruiser, *Huntington* (Armored Cruiser No. 5), as a federal depot for enrollment of members of the Naval Militia into the National Naval Volunteers. *San Diego* continued service as a personnel depot

until Rear Admiral William F. Fullam hoisted his flag aboard *San Diego* as Commander, Patrol Force, U.S. Pacific Fleet on 5 May 1917. Repairs completed, *San Diego* departed the dry dock at Mare Island on 26 May, arriving at the Coal Depot, California City, on 28 May (Historical Section, Office of the Chief of Naval Operations 1924:2).

While *San Diego* was in dry dock in April, British Admiral Sir John Jellicoe signed a memo that approved the use of merchant convoys escorted by Allied naval vessels. During the first two years of the war, the British Admiralty had rejected the idea of using convoys to protect merchant shipping. The Admiralty believed that German U-boats had a better chance of spotting a multi-ship convoy than they did a lone merchant vessel and that it did not have enough warships to escort merchant convoys. British merchant ship captains also argued against the use of convoys because they believed they could not keep a constant position, particularly at night, and were likely to accidentally ram other vessels in the convoy (Friedman 2014:277). By April 1917, the success of the U-boat offensive made clear that the Admiralty needed to change their strategy. The German government claimed that at the rate their U-boats were sinking merchant ships, the British would be compelled to stop the war by August. The British Ministry of Shipping agreed with the overall German assessment, differing only in that they thought their country could hold out until October (Friedman 2014:278). With the entry of the United States into the war, Jellicoe realized that the U.S. Navy could provide the additional escort ships the British Royal Navy lacked, and therefore convoying became a viable solution to the U-boat menace. The system paid immediate dividends. According to Friedman, by the end of October 1917, nearly 100 convoys had escorted 1,502 ships crossing the Atlantic to ports in the United Kingdom, with only ten vessels lost (Friedman 2014:278-279).

While it took place in the Pacific, *San Diego's* first voyage after departing Mare Island would presage her role as a convoy escort vessel during World War I. On 31 May, the Navy ordered *San Diego* to depart California City, intercept, and escort the steamship S.S. *Columbia* to Puget Sound, Washington. Rendezvousing with *Columbia* on 5 June 1917, *San Diego* completed her voyage on 14 June, taking on coal at the Tiburon Coal Depot and arriving in San Francisco on 16 June. After a week in San Francisco, she sailed for San Diego, where she remained until detached for duty with Commander Cruiser Force, U.S. Atlantic Fleet on 18 July (Historical Section, Office of the Chief of Naval Operations, 1924:2). *San Diego* immediately steamed for the East Coast, arriving in Hampton Roads, Virginia on 4 August 1917 (Lowe 1952:2).

After a six-day port visit in Hampton Roads, *San*

Diego reported for duty with Commander Cruiser and Transport Force, U.S. Atlantic Fleet in the North River, the southernmost section of the Hudson River between New York and New Jersey, on 10 August. *San Diego* became flagship of the Cruiser and Transport Force, U.S. Atlantic Fleet, when Rear Admiral Albert Gleaves transferred his flag from *Seattle* (Armored Cruiser No. 11) to *San Diego* on 25 August 1917. She remained flagship of the force until Gleaves transferred his flag back to *Seattle* on 19 September, allowing *San Diego* to take command of a convoy originating from Tompkinsville, Staten Island, New York (Historical Section, Office of the Chief of Naval Operations 1924:4).

On 23 September, *San Diego* steamed from New York as the ocean escort flagship of Troop Convoy Group Eight. Relieved by destroyers *Sampson* (DD-63), *Davis* (DD-65), *Fanning* (DD-37), *Winslow* (DD-53) and *Jarvis* (DD-38) on 3 October, *San Diego* arrived in Hampton Roads for coaling on 15 October, returning to her homeport in Tompkinsville the next day (Historical Section, Office of the Chief of Naval Operations, 1924:4). Three days later, she entered the dry dock in Portsmouth, New Hampshire, for overhaul and repairs. *San Diego* would remain there until 30 October. Returning to New York on 1 November, she remained at her homeport for almost two weeks (Historical Section Office of the Chief of Naval Operations, 1924:5).

San Diego began her first voyage to France on 13 November, as the flagship for Troop Convoy Group Eleven, arriving in Le Croisic on 26 November 1917. Thereafter, she ferried supplies to the seaplane base at the U.S. Naval Air Station at Le Croisic, before steaming for Brest, France, on 3 December. Arriving there the next day, she spent the next four days in port before heading back out to sea, escorting a lone merchant vessel to New York, arriving back at the New York Navy Yard on 15 December. After a brief five-day port visit, on 20 December *San Diego* left New York steaming for Hampton Roads, arriving there the next day. After taking on coal, *San Diego* returned to New York on 22 December. She entered the dry dock at the New York Navy Yard the same day (Historical Section, Office of the Chief of Naval Operations 1924:5). Because of the German submarine menace, the United States began arming merchant ships, and desperate for guns, on 26 April 1917, the Bureau of Ordnance began stripping several different sizes of guns from battleships and cruisers (Bureau of Ordnance 1920:42). Upon *San Diego* entering dry dock, Navy yard workers immediately began stripping her fourteen 6-inch guns (Historical Section, Office of the Chief of Naval Operations 1924:5).

In January 1918, the Navy stationed *San Diego* in Halifax, Nova Scotia, where she escorted merchant convoys out to rendezvous with escorting destroyers

at sea until returning to New York on 23 April 1918. After escorting another merchant convoy out to meet destroyers at sea and conducting gunnery practice off Hampton Roads in May 1918, *San Diego* escorted a merchant convoy from New York to Liverpool. Returning to the United States on 29 June 1918, *San Diego* was ordered into dry dock at the Portsmouth Navy Yard for routine maintenance (Historical Section, Office of the Chief of Naval Operations 1924:5). According to Captain Harley H. Christy, the ship was fitted with the “shoe” for paravanes while in dry dock, but the actual paravanes themselves were never installed (Heffernan, 1949:1). Paravanes, invented by Royal Navy Commander Charles Dennison Burney, were torpedo-shaped devices towed under water on each side of a ship. They were designed to either sever the mooring of undersea mines and bring them to the surface where they could be safely destroyed, or, at the very least, prevent mines from “bouncing back” toward the side of a ship after its bow draft pushed them away (Catlin 1919:2; Friedman 2014:350). Both U.S. Navy and American merchant vessels were fitted with paravanes beginning in late January 1918 in an effort to combat the German submarine minelaying offensive in the Atlantic (Catlin 1919:22).

Maintenance completed, *San Diego* departed Portsmouth on 18 July steaming for her homeport in New York. As depth measurements taken at 7 p.m. on 18 July indicated the presence of land nearby, the next morning the crew attempted to find an anchorage for *San Diego* on the Long Island shore northeast of Fire Island, New York. Unfortunately, that attempt failed and at 10:30 a.m. the next morning, the ship changed course, sighting the Nantucket Shoals light vessel, *Lightship 85*, at a distance of approximately 20 nm. Steaming in dangerous waters where German submarines were known to hunt Allied shipping, and noting the sea as “smooth with light swell which made small objects easily visible,” Captain Christy assured that crew members had taken up watch positions (Christy [1918?]:1). Thirty minutes later, at approximately 11:05 a.m., an explosion occurred off *San Diego*’s port side below the water line, immediately causing the ship to list 6–8 degrees to port. Christy believed the explosion was the result of a German mine or torpedo and immediately ordered “full speed ahead, right rudder” in an attempt to both reach shoal water and retain the ability to maneuver against a potential submarine attack. Despite the ship’s list, he did not believe *San Diego* displayed any signs she was in danger of sinking (Christy [1918?]:2). Because of the possibility that there was a U-boat in the vicinity of his ship whose crew might be capable of capturing *San Diego*, Christy did not order his crew to abandon ship until he was “absolutely sure” she would capsize (U.S. Navy 1918:10). Once both engines became inoperable, and

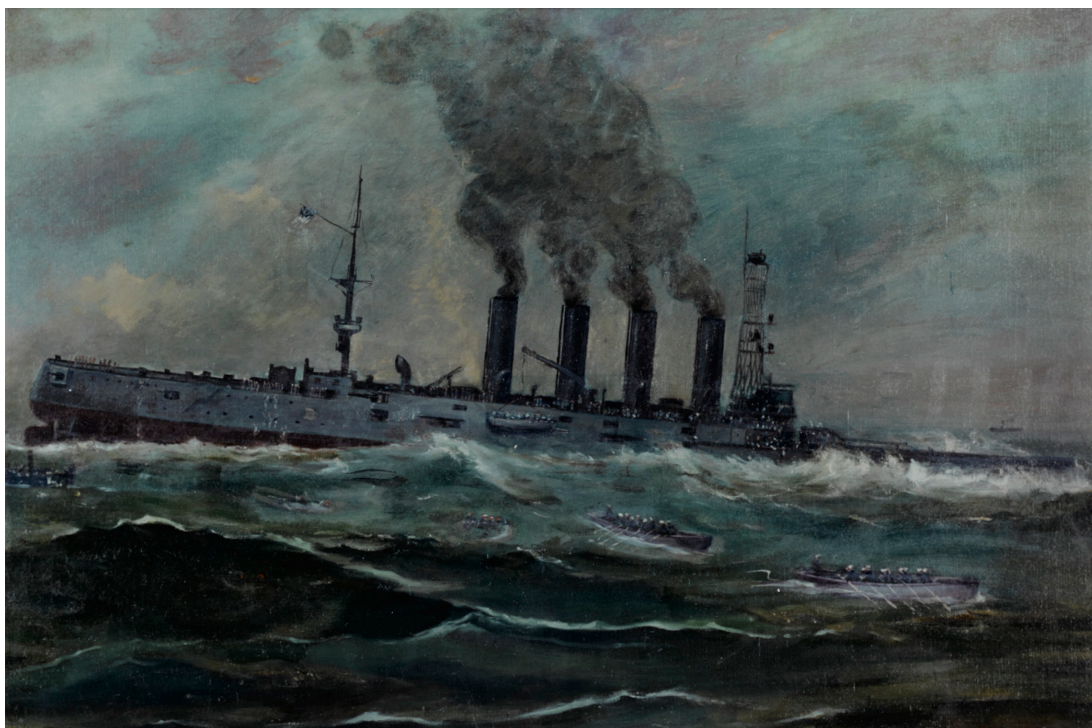


Figure 2. USS San Diego (Armored Cruiser No. 6) sinking off Fire Island, New York on July 19, 1918. (Painting by Francis Muller, 1920. (Courtesy of the Navy Art Collection. U.S. Naval History and Heritage Command Photograph #NH-55012-KN.)

with reports that the radio compartment was taking on water, Christy ordered the crew to abandon the ship (Figure 2). Captain Christy, along with his executive officer, Commander Gerard Bradford, were the last to leave the ship. Christy clambered over the starboard side on a rope while Bradford left on the port side. Only six Sailors of the original crew complement of 1183 were lost (U.S. Navy 1918:85). Captain Christy then watched his ship roll over, bottom side up “in a symmetrical position with the keel inclined about ten degrees to the horizontal, the forward end elevated” before gradually sinking (Christy [1918?]:1).

As the explosion had destroyed *San Diego*'s radio, her crew was unable to send a request for help. Captain Christy ordered Lieutenant C. J. Bright to use one of the ship's dinghies and row to Long Island to report the disaster and request help. Lieutenant Bright dutifully carried out these orders and soon American merchant steamships *Malden*, *Bussan*, *Captain Brewer*, *F.P. Jones* and *Captain Dodge* arrived to rescue the stranded sailors (Historical Section, Office of the Chief of Naval Operations, 1924:6).

Alerted to the possible presence of a U-boat off the coast of New York, the Navy dispatched aircraft from the First Yale Unit based in Huntington, Long Island, to investigate. According to historian A. B. Feuer, the excited aviators believed they had located a submerged U-boat in approximately 100 ft. (30.48 m) of water and “a number of bombs were dropped on the target.”

Ensign Worthington Scott, commanding officer of the yacht *Linta* was also dispatched to the scene. When Scott arrived he found so many aircraft attacking the supposed sunken U-boat, “it was a wonder that some of the low-flying planes were not knocked out of the sky by the heavy columns of water thrown up by the explosions.” The bombs dropped on the Yale aviators' target eventually caused wreckage, including papers and photographs, to rise to the surface, conclusively identifying the sunken object as *San Diego* (Feuer 1999:105–106).

The Aftermath of the Loss of USS San Diego

At the Court of Inquiry that was held a just a few days following the sinking, Captain Christy testified as to the circumstances surrounding the loss of each Sailor killed as a result of the attack. Engineman 2nd Class Thomas E. Davis was last seen near the port shaft and “presumably went down with the ship alive, as the flooding of the port engine room must have prevented his escape and there was no other escape from his shaft alley” (U.S. Navy 1918:69). Engineman 2nd Class James F. Rochet and Machinist Mate 2nd Class Frazier O. Thomas were also killed in the port engine room and their bodies may have gone down with the ship as well (U.S. Navy 1918:69). According

to Christy's testimony, three Sailors, Seaman 2nd Class Paul J. Harris, Machinist's Mate 2nd Class Andrew Munson, and Fireman 1st Class Clyde C. Blaine are believed to have drowned while or after abandoning ship (U.S. Navy 1918:69–70). Lieutenant (j.g.) Frank Devlin testified that he saw two deceased Sailors in the starboard berth deck adjacent to frame No. 84, raising the possibility of the total number of Sailors killed being eight (U.S. Navy 1918:24). However, because the starboard berth deck passageway is located immediately above the engineering spaces, it is possible that the bodies Devlin saw were those of Rochet and Thomas and the total number of sailors killed is only six as is attested to in the Court of Inquiry (Orzech [2000?]:15).

On 20 July 1918, Secretary Daniels told the *New York Times*, noting the deaths of six Sailors, that the loss of *San Diego* did not have a strategic impact on operations. According to Daniels, German submarine attacks and minelaying off the East Coast were “more or less of a menace of course, but they will not prevail in stopping our transports going overseas with soldiers...as fast as we can send them” (*New York Times* 1918a:7). Despite the loss of the ship not being strategically significant in Daniels's mind, the U.S. Navy did not forget about *San Diego*, conducting multiple surveys of the wreck site even while war still raged in Europe.

On 20 July 1918, the Navy dispatched the destroyer *Perkins* (DD-26) and the torpedo boat *Bagley* (TB-24) to investigate the wreck. Navy diver Gunner (T) William Williamson used a motor launch from *Perkins* as a diving platform and made two dives on *San Diego*. While Williamson's first dive lasted only nine minutes and simply identified the wreck as that of *San Diego*, he used the second dive, which lasted 18 minutes, to investigate the wreck site in as much detail as time allowed (Knox 1918:1). On his first dive, Williamson found *San Diego* “bottom up, resting on the smoke pipes and mast,” (Knox 1918:1). Descending again after a short break, Williamson found a hole on the port side abreast the number four smokestack and 12 ft. (3.66 m) below *San Diego*'s waterline, that measured approximately 5 ft. (1.52 m) in diameter (Knox, 1918:1–2). While Williamson judged the bottom of the hull to be in “excellent condition,” he found areas where the depth charges dropped on the wreck site amid the alleged sighting of a German submarine had caused several small holes, through which air was still escaping (Knox 1918:2). In addition to surveying the ship, Williamson retrieved from the ocean floor a tapered steel plate measuring approximately 18 x 10 in. (46 x 25 cm), which he judged to have come from *San Diego*'s engine room bilge (Knox 1918:2). While available primary sources do not indicate that Navy divers performed any further

surveys of the ship, the Navy would return to the wreck site twice more in 1918.

Concerned that the wreck was in relatively shallow water and could damage the hull of any large ship steaming over her, the Navy ordered the tug *Passaic* (YT-20) to take soundings, or measure the depth between the remains of *San Diego* and the surface of the ocean on 26 July 1918. *Passaic* determined that parts of *San Diego* were no more than 38 ft. (11.58 m) below the surface at low tide, leading the Navy to consider destroying or removing the wreck. However, a subsequent sounding taken by the tug *Resolute* (SP-1309) on 15 October determined that the wreck had sunk 2 ft. (0.61 m) since the soundings taken by *Passaic* on 26 July. With that additional two feet allowing sufficient clearance for deep draft vessels, the Navy chose not to take further action (Gentile, 68-69; Grohman, 131).

The Navy's decision not to salvage the ship played a large role in a lawsuit brought by the crew of *San Diego* as they attempted to receive compensation for the \$100,000 in Liberty Bonds lost when she sank in July 1918. The officers and crew actually purchased the bonds during the spring of 1917 when *San Diego* was still on the West Coast. Unfortunately, the bonds weren't available for the Sailors to take possession of until several months later when *San Diego* made a port visit to New York. The officers and crew were forced to keep the Liberty Bonds aboard ship because “the exacting nature of convoy service precluded taking of the bonds ashore by the owners, and the securities could not be safely transmitted to relatives”—sailors could not send registered packages through the ship's mail service (*New York Times* 1919). Controller of the Treasury Walter W. Warwick decided in the “test case” brought by *San Diego*'s Chief Water Tender who had lost \$350 worth of Liberty Bonds that, “the destruction of said bonds has not been established by clear and unequivocal proof” and “there is no provision of law authorizing the issue of duplicates in lieu of lost coupon bonds” (*New York Times*, 1919). According to author Adam M. Grohman, “it was not until [the Department of the Treasury] was informed by various sources, including Assistant Secretary of the Navy, Franklin D. Roosevelt, that the US Navy ‘had dropped thirty bombs on the wreck’” that the sailors received replacement Liberty Bonds (Grohman, 2008:136; *New York Times*, 1919).

On 16 May 1921, Saliger Ship Salvage Corporation of New York City wrote the Department of the Navy and requested authorization to salvage *San Diego*. A few weeks later, Solicitor General of the Navy Graham Egerton recommended that the Commandant, Third Naval District sell the salvage rights to *San Diego* “as long as no expense to the government is involved” and “that the government shall have a preferred right

to obtain by purchase such material from the vessel as may be desired in case the operations are successful” (Egerton 1921). Despite this recommendation, there is no documentation that indicates the Navy responded to the salvage request or entered into a salvage contract for *San Diego*.

With her officially struck from the service’s inventory of ships on 26 August 1918, and content in the knowledge the wreck did not pose a navigational hazard, *San Diego* faded beneath the waves. This, however, did not abate speculation as to the cause of the vessel’s sinking.

A Mine, Torpedo, or Sabotage?

Within a day of the loss of the ship a controversy erupted over just what caused her sinking, with Captain Christy and some of the crew asserting their ship had been torpedoed, while other sailors asserted that their ship had hit a mine. Despite the Court of Inquiry’s official declaration that a German mine caused *San Diego*’s demise, the question has persisted for nearly 100 years (U.S. Navy 1918:87–88). Furthermore, the controversy over what sank *San Diego* took on an entirely new dimension in 1999 when a historian at the University of North Carolina–Chapel Hill asserted that a bomb planted aboard by a German espionage agent sank the ship (Briggs, 1999).

In his report on the loss of his ship, Captain Christy didn’t offer a definitive opinion on whether a torpedo or mine struck *San Diego* (Christy [1918?]). The controversy appears to have begun because of a statement issued by the Navy that was quoted in a 21 July 1918 article in the *New York Times*, and furthered by secondhand accounts from both sailors and merchant seamen. According to the Navy, Christy reported “that he [was] inclined to the belief that the ship was sunk by a torpedo” (*New York Times* 1918a). While the statement attempted to downplay Christy’s apparent claim, stating that a “torpedo wake was not seen” and that there was “no convincing evidence a periscope was seen,” the Navy acknowledged that the damage to the ship, which occurred on the port side, abaft beam, “discourage[d] the mine theory” (*New York Times* 1918a). The *Times* furthered the controversy in another article that reinforced the mine theory, but also asserted *San Diego*’s crew differed on what caused the demise of their ship (*New York Times* 1918b). The *Times* quoted James F. Brewer, the captain of SS *Bussum*, one of the ships that rescued a part of *San Diego*’s crew, at length. According to Brewer, “stories of the disaster told to me indicated that the general belief was the ship was torpedoed” (*New York Times* 1918b). The same article quoted an unnamed sailor who stated that he did not believe his ship had

been sunk by a torpedo until speaking to “one of the men who had worked in the engine room when the explosion occurred. He said that man was absolutely certain that the explosion was from a torpedo which tore through the engine room right before his eyes. Later on, adrift on the [rescue] raft we floated through a stretch of water that was exceedingly oily and dirty, and it was the general belief on the raft that the appearance of the water could be taken as an indication of a submarine that had been destroyed by shell-fire” (*New York Times* 1918b).

A quickly convened Court of Inquiry opened aboard USS *Maui* (ID-1514) on 22 July 1918. The Court questioned multiple sailors from *San Diego*’s crew, as well as Captain Christy. Christy testified that the explosion occurred aft of its widest point, which he stated “tends to indicate that it was not due to a mine, unless the mine was tethered to another, which is entirely possible” (U.S. Navy 1918:9). None of the sailors questioned by the Court stated that they definitively saw any evidence of a submarine. Lieutenant Clarkson J. Bright and Sergeant Ransom Larkin Vanderverter, USMC, testified that they saw objects that could have been a submarine periscope but neither were positive in their identification (U.S. Navy 1918:41, 59). Lieutenant Commander Edward V.W. Keen, USNRF, Commanding Officer, Base 8, Commander Squadron 10, Minesweeping Division, lent further credence to the mine theory in his testimony. According to Keen, on 19 July 1918, he saw mines approximately 8 nm east of Fire Island. Keen also discredited a report of a submarine seen by an aircraft in the vicinity. Multiple destroyers fired depth charges at the supposed U-boat, with the commanding officer of *Perkins* definitively declaring it so. Keen disagreed and argued that the target was merely a sunken coal barge. To resolve the dispute, Keen ordered a diver aboard *Perkins* to inspect the sunken object. After approximately ten minutes below the surface of the ocean, the diver resurfaced and reported that the object was indeed a coal barge (U.S. Navy 1918: 49).

Based on the witness testimony as well as the known presence of recently placed mines in the vicinity of Fire Island, on 25 July 1918 the Court concluded that a mine had indeed sunk *San Diego* and closed the case (U.S. Navy 1918:47, 87). Less than a month later, another article in the *Times* claimed to have identified the culprit, German U-boat *U-56*. An article in the 5 August 1918, edition of the *Times* stated, “the United States cruiser *San Diego* was sunk off Fire Island last month by a mine laid by the German submarine *U-56*, which captured and burned the Canadian schooner *Fornfonstein* in the Bay of Fundy [Canada]” (Grohman 2008:131). Despite the *Times*’s definitive tone, the article was incorrect, as SM *U-56* was last sighted depositing the crew of the Norwegian

merchant ship *Ivanhoe* ashore at Lodsvik, Norway, on 3 November 1916. *U-56*, damaged the previous day by the Russian destroyer *Grozovoi*, is presumed to have sunk shortly thereafter with all hands aboard. According to Grohman's recent interpretation, "most likely, the article simply was missing the 1 before the 56" (Grohman 2008:132). Indeed, German records indicate that SM *U-156* left Germany on 15 June 1918, with orders to lay mines in the shipping lane off the south shore of Long Island, New York, east of Fire Island lightship (Clark 1929:156).

In 1990, authors Henry Keatts and George C. Farr somewhat breathed new life into the controversy in their book *Dive into History Volume 1: Warships*. The authors claimed that "in mid-August [1918], the commander of [a] U-boat announced to the crew of the Canadian trawler *Triumph*, that his U-boat had done the job with a torpedo" (Keatts and Farr 1990:93). The U-boat commander was most likely Kapitänleutnant Richard Feldt of *U-156*. According to historian Charles Dana Gibson, *U-156* captured *Triumph* on 20 August 1918, took her crew prisoner and used *Triumph* as "a German man-of-war" (Gibson 1991:2). While Keatts and Farr do not indicate the source of this information, it is known that *U-156* arrived off the American coast in June 1918. Her whereabouts on 19 July are unknown. However, two days after *San Diego* sank, *U-156* is known to have been off the coast of the town of Orleans, located on the east coast of the Cape Cod, Massachusetts, peninsula, approximately 200 nm northeast of Fire Island. Beginning at approximately 10:30 a.m. on 21 July, *U-156* began a surface attack on the tugboat *Perth Amboy* and four barges she'd taken in tow for the short voyage to the Chesapeake Bay. While the sailors aboard *U-156* did eventually sink all five of their targets, their poor aim resulted in multiple shells missing their targets entirely and landing on Nauset Beach, Orleans, and a nearby marsh. During this engagement *U-156* accidentally became the only enemy warship to fire on the American mainland during World War I (Klim 2014). Unfortunately, any German records that might verify Kapitänleutnant Feldt's claim disappeared with the U-boat. She is last known to have entered the North Sea Mine Barrage on 24 September (Grant 2002:157–158). The absence of documentary evidence left ample room for additional speculation on the cause of *San Diego*'s demise. Less than a decade after Keatts and Farr published their book, an academic historian would assert that both the mine and torpedo theories were incorrect; German sabotage had sunk *San Diego* (Briggs 1999).

In a January 1999 article published in the University of North Carolina at Chapel Hill online magazine *Endeavors*, historian Russel van Wyk claimed that German espionage agent Kurt Jahnke planted a

bomb in *San Diego*'s boiler room. Von Wyk based his claim on German and Russian documentary sources, including an April 1945 interrogation of Jahnke and his wife performed by the Soviet intelligence group Smersh, or "Death to Spies" (Birstein 2013). However, the *Endeavors* article does not provide any evidence to support this claim. The article quotes Jahnke as telling the Soviets that "approximately during 1917, I with the help of my agents managed to organize diversionary acts on 14 American steamers. As a result of these diversions, all the steamers were sunk" (Briggs 1999). Despite the lack of apparent evidence, the sabotage theory has been repeated by both journalists and historians. Journalist Sean Chase repeated the theory in a 2008 column in the *Pembroke* (Canada) *Daily Observer* (Chase 2008). Perhaps more unexpectedly, historian Glenn P. Hastedt definitively declared Jahnke responsible for the loss of *San Diego* in *Spies, Wiretaps and Secret Operations: An Encyclopedia of American Espionage* (Hastedt 2011:412–413).

In its investigation in 1918 the Navy did not ignore the possibility that enemy sabotage could have sunk *San Diego*. In the proceedings of the Court of Inquiry two sailors denied that sabotage sank their ship. Engine room division officer Lieutenant (j.g.) J. P. Million stated that he did not believe an "infernal machine set to go off at a certain time in the coal bunker" could have caused the same damage and he had no doubt that an external explosion sank the ship (U.S. Navy 1918:17). Chief Water Tender James Henry Poteat stated that he "searched through [the coaling bunkers] and everything was secure." Furthermore, Poteat stated that he stationed sailors who would have seen anything placed in the coal bunker that didn't belong there during re-supplying operations (U.S. Navy 1918:37).

Revived Interest in USS San Diego

San Diego was the only major warship lost by the U.S. Navy during the Great War, but she was not the only American warship sunk, nor did she suffer the largest loss of life (Feuer 1999:106). Destroyers *Chauncey* (Destroyer No. 3) and *Jacob Jones* (Destroyer No. 61) were lost while escorting convoys in the eastern Atlantic Ocean. While the loss of *San Diego* resulted in the death of only six sailors, twenty-one Americans perished aboard *Chauncey* and sixty-four aboard *Jacob Jones*. Furthermore, when German submarine *U-53* torpedoed *Jacob Jones* on 6 December 1917, she became the only American destroyer lost to enemy action during the war (Still, Jr. 2006:399).

The prominence of the loss of *San Diego* appears to primarily be because of location. In contrast to both *Chauncey*, which sank 110 nm west of Gibraltar, and

Jacob Jones, which sank approximately 30 nm from the Isles of Scilly, United Kingdom, *San Diego* sank in shallow water a short distance from Fire Island, New York. As it did in 1921, her easily accessible location again made *San Diego* a target for a New York-based scrap metal salvage corporation, and brought *San Diego* back to the Navy's and the American public's attention in the 1950s.

In a letter dated 15 March 1957, the Office of the Chief of Naval Operations (OPNAV) directed the Bureau of Supplies and Accounts to dispose of the wreck of *San Diego* in "a manner most advantageous to the government" because "the Navy has evidenced no interest in the sunken hulk" (Cox 1957). The Commander of the New York Naval Shipyard subsequently wrote OPNAV, informing them that the Navy sold *San Diego* to New York-based Maxter Metals Corporation "for scrapping purposes only" in October 1957 for \$1,221 (Goodpasture 1957; Grohman 2008:137). This correspondence is the only known surviving document that details the sale of *San Diego*. According to Nathaniel Patch, an archivist at the National Archives and Records Administration (NARA) in College Park, Maryland, the contract between the Navy and Maxter Metals Corporation would not have been designated a permanent record under the Bureau of Ships records retention schedule and therefore not retained by NARA (Nathaniel Patch 2016, elec. comm.). While the specific provisions of the contract are unknown, Defense Logistic Services Center Deputy Commander Colonel Frank Mercer claimed in an undated letter to Senator Kenneth B. Keating (R-NY), the original terms of the contract between the Navy and Maxter Metals allowed the purchaser three years to scrap and remove *San Diego*. However, before the expiration of the three-year period the Navy extended the contract until 28 June 1963 (Mercer [1963?]).

While waiting for the most advantageous point in the scrap steel market to perform salvage operations, Maxter contracted with members of the Oceanographic Historical Research Society (OHRS) of New York City to survey of the wreck site beginning in late 1961. The OHRS survey determined that *San Diego* was still nearly in the same position divers found her in 1918, upside down "with an approximate 10° list to her normal port" (Snediker 1962). The bow of the ship, "head[ed] 340° magnetic and [was] 55 ft. [16.76 m] from the surface. The stern [was] reciprocal 160° magnetic and [was] 75–80 ft. [22.86–24.38 m] from the surface" (Snediker 1962). Furthermore, according to OHRS, "the entire main superstructure of the ship [was] buried [in the ocean floor] and there [were] two holes in her normal starboard side, although all reports [stated] that she was torpedoed or mined on the port side" (Snediker 1962).

In addition to surveying the overall condition of the ship, OHRS divers entered *San Diego* on multiple occasions and recovered "many artifacts exemplary of Navy life in World War I" (Grohman 2008:138, Snediker 1962). Available documentation does not indicate the type or number of artifacts OHRS divers removed from *San Diego*, but according to a letter written to the Office of Naval Records and History by OHRS Managing Director G. Graham Snediker, objects removed from the ship were donated to "various local museums and historical societies cooperating with [OHRS]" (Snediker 1962).

A year later, in 1963, title to the ship reverted to the Navy because Maxter hadn't salvaged the ship (Mercer [1963?]). In conjunction with Maxter's failure to perform salvage operations in a timely manner, a lobbying effort led by the American Littoral Society, several nautical trade associations and small recreational diving clubs helped convince the Department of Defense (DOD) not to renew the contract for another three-year period (Orzech [2000?]:16). This, however, would not be the last time the Navy considered selling the wreck of *San Diego*.

In September 1965, Robert Rickard, president of Aquatic Technical Services, Inc. wrote to the Chief of Naval Operations Admiral David L. McDonald and offered to purchase *San Diego* for "experimental use" (Orzech [2000?]:17). Rickard explained to Admiral McDonald that he wished to conduct experimental work on "new types of diving gear, diving gas mixtures, mixed gas management...as well as experimental work on underwater cutting and welding." Through this work, Rickard ultimately wanted to transform *San Diego* into an enhanced habitat for marine life (Orzech [2000?]:17). The Judge Advocate General's office quickly recommended that the Navy accept Rickard's offer to buy the ship. However, in November the Navy informed Rickard the service would not sell *San Diego* because it chose to begin "making a particular effort to protect the historical value of all sunken naval ships, particularly those with valuable artifacts and the remains of deceased crew members entombed" (Brush 1965). Undeterred, Rickard ignored the Navy's decision and engaged in the first large-scale unauthorized salvage of artifacts from the wreck site.

On 7 December 1965, Allan Bohm, a citizen from Westbury, New York, who had worked with the American Littoral Society to encourage DOD and the Navy not to renew the Maxter Metals's salvage contract in 1963, wrote a letter of complaint to the Defense Logistics Center. Bohm's letter claimed that not only was Rickard engaged in actively salvaging one of *San Diego*'s propellers, he claimed to be doing so on behalf of the Navy. Unfortunately, the Navy did not investigate the matter, merely informing Bohm "as Mr. Rickard now knows, the Navy does not desire

the wreck be disturbed. It is hoped that he has ceased salvage operations.” Bohm also appears to have disregarded the Navy’s suggestion that if Rickard’s salvage operations were indeed ongoing, “you may bring this to the attention of the Commandant, Third Naval District (Legal Office)” (Orzech [2000?]:18).

Bohm’s allegation was true. According to diver Ben Manuella, a member of Rickard’s salvage crew, after cutting away the port propeller he winched it up off the ocean floor, intending to leave it just below the surface until their salvage vessels arrived back in port in Staten Island, New York. Unfortunately, during the return voyage, the cable holding the propeller broke away, allowing the propeller to plummet back to the ocean floor “somewhere between *San Diego* and Staten Island” (Gentile 1989:77). The vessel would also lose her starboard propeller within a decade.

In the autumn of 1973, *San Diego*’s remaining propeller was blown off the wreck by forces unknown and lodged in the ocean bottom. Eight months later in July 1974, diver Ed Betts and salvage master George Dyott began an operation that intended to salvage the propeller and sell it for scrap. However, during the salvage attempt, the propeller wedged itself against the hull of their salvage barge *Lehigh Valley 401*, causing the salvage derrick attempting to lift it to overstress and damage the ship’s hull, ultimately capsizing the vessel. The salvage derrick once aboard *Lehigh Valley 401* still lies on the ocean bottom approximately 75 ft. (22.86 m) off the starboard side of *San Diego*’s stern (Gentile 1989:79–80). A year later in September 1975 the Admiralty Counsel section of the Department of Justice received a telephone tip that, using his ship *Sea Salvor*, salvage operator Robert Shourot was attempting to retrieve the propeller from the ocean floor. The Admiralty Counsel wrote Shourot, “Your continued possession and/or disposition of the propeller in question would constitute wholly unauthorized and wrongful conduct.” In his response, Shourot boldly confirmed that he had already salvaged a propeller from a Navy vessel and that it was in his possession in Bay Shore, New York. Shourot, however, claimed not to know which vessel the propeller came from and that he “had no intention to commit any wrongful acts [and] must confess to my ignorance as to what wrongful conduct I have committed.” Surprisingly, instead of initiating an investigation and retrieving the propeller, the Admiralty Counsel simply confirmed that based on Shourot’s description of the propeller it had come from *San Diego* and while “our records show that the U.S. Navy has not given up any of its rights to ex-USS *San Diego*” Shourot could make a claim against the Navy for his costs incurred in the illegal salvage operation (Orzech [2000?]:21). There is no indication that Shourot asked for the reimbursement of his costs, and according to author Gary

Gentile, Shourot sold the propeller for scrap (Gentile 1989:81). Unfortunately, large-scale salvage operations like those led by Rickard and Shourot were not the only threats to *San Diego* that emerged in the 1960s and 70s; recreational divers simultaneously began removing objects from her interior.

Recreational Diving and the USS San Diego Site

The first documented unauthorized removal of small objects from *San Diego*’s interior occurred during the OHRS dives on the wreck site in 1961 and 1962. Recreational sport divers began regularly removing artifacts from the many sunken vessels in the waters off New York after the creation of the Eastern Dive Boat Association (EDBA) in 1975. (Orzech [2000?]:23). By the 1990s, thousands of recreational divers were visiting sunken vessels like *San Diego* each year and according to EDBA President Steve Bielenda, the removal of objects from wreck sites was quite widespread (Orzech [2000?]:23). Some of these recreational divers took extreme risks in their pursuit of artifacts. Six individuals are known to have lost their lives diving on *San Diego*, beginning with diver John Hume’s death in 1974. Divers subsequently recovered the bodies of all six individuals killed, leaving any human remains subsequently located on or around *San Diego* likely associated with the sailors killed when she sank in 1918 (Orzech [2000?]:27).

While the Navy did not exhibit any interest in the plundering of the site in the 1970s and 1980s, activities by recreational divers would precipitate the service’s renewed interest in the 1990s.

The U.S. Navy Returns to the USS San Diego Site: The 1995 Site Assessment

Invariably, as the recreational diving community’s interest in sunken wrecks off the coast of the Northeast increased, professional rivalries developed between dive boat owners who make their livelihood serving the recreational diving community. One such professional rivalry led to the Navy’s first visit to *San Diego* since she sank.

In October 1992, Sal Arena, owner of the dive boat *Sea Hunter III*, filed a complaint with the Suffolk County, New York, police alleging that divers from Bielenda’s boat *Wahoo* were bringing 3-inch shells from *San Diego*’s magazines to the surface in order to salvage the brass portion of each shell. Notified of this allegation, and the police’s seizure of a live round of ammunition from a Smithtown, New York, dive shop on 14 October, the U.S. Coast Guard estab-

lished an exclusion zone around *San Diego*, preventing the operation of any vessel within a 500 yd. (457 m) radius of the wreck site (Orzech [2000?]:24). For its part, the Navy dispatched Explosive Ordnance Mobile Unit Two from Newport, Rhode Island, to investigate. The investigation report written by Lieutenant William Fenton on 15 October 1992, stated that deterioration of the ship's deck had recently exposed the 3-inch magazine. While recreational divers had long had access to the 6-inch and 8-inch shells carried by *San Diego*, those rounds were not "fixed" and lacked a brass casing suitable for salvage. Lieutenant Fenton's report concluded that "the rounds left alone in the magazines pose little to no threat. They become dangerous when people play with them" (Orzech [2000?]:25). After obtaining an agreement with Arena, Bielenda, and other dive boat owners that prohibited further salvage of ordnance from *San Diego*, the Captain-of-the-Port reopened the wreck site and the Coast Guard cancelled its exclusion zone immediately after LT Fenton issued his report on 15 October (Orzech [2000?]:25–26). This crisis averted, the Navy would return to *San Diego* to conduct a more thorough archaeological survey of the site just three years later.

Aware that *San Diego* was continuing to deteriorate and unauthorized salvage of artifacts by recreational divers was widespread, in January 1995 the Director of Naval History, Dr. William S. Dudley asked the Ocean Sciences Institute to investigate the wreck under the overall direction of NHHC Underwater Archaeology Branch Head Dr. Robert Neyland. The survey was intended to "make a quick assessment of the shipwreck and the site in order to address public-safety and historic-preservation concerns" (Orzech [2000?]:31). The Navy assigned Mobile Diving and Salvage Unit Two (MDSU-2) from Little Creek, Virginia, Explosive Ordnance Disposal Mobile Unit Two from Earle, New Jersey, and the Fleet Imaging Command, Atlantic, commonly known as the "Combat Camera Group" from Norfolk, Virginia, to conduct the survey, scheduled for June 1995. At Dr. Dudley's request, on 27 April 1995, project coordinator Dr. James K. Orzech of the Ocean Sciences Institute, notified Bielenda of the survey and asked for the assistance of the Eastern Dive Boat Association. Less than a year earlier, in September 1994, Captain Alvin Golden of the dive boat *Golden Dream III* wrote Secretary of the Navy John H. Dalton (July 1993–November 1998) pledging the EDBA's support for the preservation of the destroyer *Turner* (DD-648) that sank off Sandy Hook, New Jersey, 3 January 1944. On this occasion, however, the EDBA's stance would be quite different. Bielenda sent a letter to Secretary Dalton on 28 April 1995, alleging that Dr. Dudley and the Naval Historical Center "plans to use whatever legal means are available to [them] to prevent the recreational sport

diving community from visiting the wreck" that he contended the Navy had abandoned in 1957 (Bielenda 1995a). Both the office of the Secretary of the Navy and the Naval Historical Center took Bielenda and the Eastern Dive Boat Association's concerns quite seriously.

On 23 May, Dr. Orzech met with Bielenda and several other members of EDBA in Bielenda's home in Miller Place, New York. Dr. Orzech and Commander Stephen Riordan clarified the Navy's position in that while the service did not have any intention of preventing recreational sport diving on the *San Diego* wreck site, the Navy still retained ownership of the ship and removal of artifacts from *San Diego* was illegal (Orzech [2000?]:32–33). Unfortunately, the discussion was all for naught, as earlier that day Bielenda, through his attorney Peter Hess, filed an Admiralty action in the United States District Court for the Eastern District of New York. The lawsuit, *Undersea Adventures Inc. v. USS San Diego*, asked Judge Arthur D. Spatt to seize *San Diego*, award Bielenda both "exclusive dominion and control of the salvage activities on the *San Diego* without interference by third parties" and payment from the Navy for Bielenda's previous salvage of artifacts from the wreck site. Judge Spatt denied this request because Hess had not notified the federal government of the lawsuit. Indeed, Hess only notified the Office of the Judge Advocate General of the lawsuit via letter on 25 May 1995, two days after he filed it (Orzech [2000?]:34–35).

In their haste to rush to court, Bielenda and Hess had not even waited for the Navy to respond to Bielenda's letter to Secretary Dalton. Assistant Secretary of the Navy for Installations and Environment, Captain (Ret.) Robert B. Pirie, Jr., wrote to Bielenda on 25 May 1995, asserting that upon Maxter Metals's default of contract in 1963, "the Navy reclaimed all right, title and interest and withdrew the ship from sale." Furthermore, Pirie wrote, "it is not now, and never has been the Navy's intention to 'prevent the recreational sport diving community from visiting the site'" as Bielenda contended in his letter to Secretary Dalton (Pirie, 1995:1–2). Still unwilling to take the Navy at its word, on 1 June, Bielenda issued a press release requesting donations for his legal quest to "block destruction of the shipwreck *USS San Diego*" (Bielenda, 1995b). Against this legal backdrop, the Navy continued preparations for the planned archeological survey of *San Diego* scheduled to commence in early June 1995.

MDSU-2 began the survey with the first dive on *San Diego* taking place on 5 June 1995. During this first dive, MDSU-2 externally surveyed *San Diego* and rigged a mooring buoy for the unit's support craft *D/V Seahorse* (NS-85). During the course of 50 dives on the wreck site from 5 to 15 June, MDSU-2 concluded that the hull had shifted and the lean to the port side

had increased to 15°, and the interior of the ship had deteriorated to the point where conditions for divers were extremely dangerous, particularly because of “collapsing interior structures, separating hull platings, and the presence of significant amounts of unexploded ordnance” (MDSU-2 1995:3). Should a diver wish to investigate *San Diego*’s interior, MDSU-2 found no shortage of access points in the degrading hull, most located on the starboard side. Structural collapse from frame No. 29 through 35 had caused a “large gash,” in the hull, there were three holes between frames No. 60 and No. 68 and a third large hole from frame No. 91 to No. 102. These holes were in addition to the hole on the port side caused by the fatal explosion in 1918. Divers found the port side “largely intact and covered with marine growth,” noting only two small holes between frames No. 86 and No. 93 (Orzech [2000?]:6). In addition to the relatively minor deterioration of the port side of the hull, divers also found many portions of the ship’s superstructure protruding from the ocean floor on the starboard side including: the cage mast, flying bridge and deck, forward 6-inch barrette, forward starboard crane superstructure and housing, forward starboard boatwinch, No. 3 stack vent, the boat-deck superstructure, the signal tower and mast, two –6-inch guns and four 3-inch guns (Orzech [2000?]:6). The most significant damage to the ship was located at the stern, beginning at frame No. 124 and moving aft. That section suffered from “a general deterioration and collapse” (Orzech [2000?]:6). Despite the multiple holes in the hull and the collapse of her stern, evidence collected during the survey led Orzech to conclude that overall *San Diego* “retain[ed] a moderate to high degree of structural integrity.” He also concluded that the ship retained a moderate to high degree of archaeological integrity because its large size and deteriorating interior discouraged unauthorized salvage of small artifacts left aboard when she was sunk in 1918 (Orzech [2000?]:46).

Despite the ship’s generally good condition, divers were able to penetrate the 6-inch magazine at the aft of the ship and recover one projectile for study at Weapons Station Earle. The test detonation of the shell by Explosive Ordnance Disposal technicians “clearly show[ed] that this ‘projo’ still packed a lethal wallop after all these years underwater,” reinforcing the necessity of the 1992 ban on salvage of ordnance from the wreck site (Orzech [2000?]:46).

In addition to MDSU-2’s visual survey of the overall condition of *San Diego* and the recovery of a 6-inch shell, Fleet Imaging Command, Atlantic, (FICA) which later merged into the Navy Public Affairs Support Element (NPASE) headquartered at Naval Station Norfolk, Virginia, shot video and took photographs of the ship (Orzech [2000?]:46b). Any existing photographs and video footage shot by FICA

are likely located at NPASE headquarters.

The site survey completed, the Navy’s focus returned to the courtroom and Bielenda’s lawsuit over control of *San Diego*.

Undersea Adventures, Inc. v USS San Diego: The Saga Continues

The Navy, represented by the Office of the Judge Advocate General and the Justice Department’s New York Torts Branch for Admiralty and Aviation, convinced that Bielenda’s claim that the Navy abandoned *San Diego* was groundless, decided that working with recreational divers like Bielenda to preserve sunken naval vessels was a preferred option to litigating against them in court (Orzech [2000?]:48). The challenge for the government became convincing Bielenda and his primary attorney, Peter Hess, that cooperation was better than a legal confrontation.

Department of Justice Admiralty Law attorney Janis Schulmeisters, in a 25 July 1995 letter to Hess, wrote that while the government was prepared to challenge Bielenda and anyone else identified as having taken artifacts from *San Diego*, “ending the litigation at this stage clearly provides the appropriate ‘tone’ for cooperation between the Navy, plaintiff and others” (Schulmeisters, 1995:3). Hess wasted no time in replying that “the Navy’s new-found interest in the *San Diego* as a historic shipwreck is both untimely and is asserted by a party with the dirtiest of unclean hands” because of the 1957 sale of the wreck to Maxter Metals, and that he would see the Navy in court (Orzech [2000?]:48). Despite Hess’s defiant tone, Schulmeisters’ letter apparently did sufficiently convince one interested party, Steve Bielenda.

While disagreeing with the Navy’s position that divers could not legally remove artifacts from *San Diego*, Bielenda wrote Hess on 8 and 10 August 1995, requesting dismissal of the lawsuit (Bielenda 1995c, 1995d). Obviously, these letters did not have the intended effect, because Bielenda wrote Hess another strongly worded letter on 19 August, stating “I must conclude that you did not understand me clearly when I instructed you...to terminate the suit. The case is now closed” (Bielenda 1995e). Yet Bielenda still couldn’t get out from under his own lawsuit. In a letter to Hess dated 12 October 1995, Bielenda wrote, “I want this case against the Navy dropped without prejudice. I’m still trying to understand the part of ‘NO’ you don’t understand. The ‘N’ or the ‘O.’” (Bielenda 1995f). Hess finally acknowledged Bielenda’s wish to withdraw from the lawsuit against the Navy in a letter to Judge Arthur D. Spatt of the Eastern District of New York on 28 February 1996, requesting permission to withdraw Bielenda from the lawsuit and substitute a

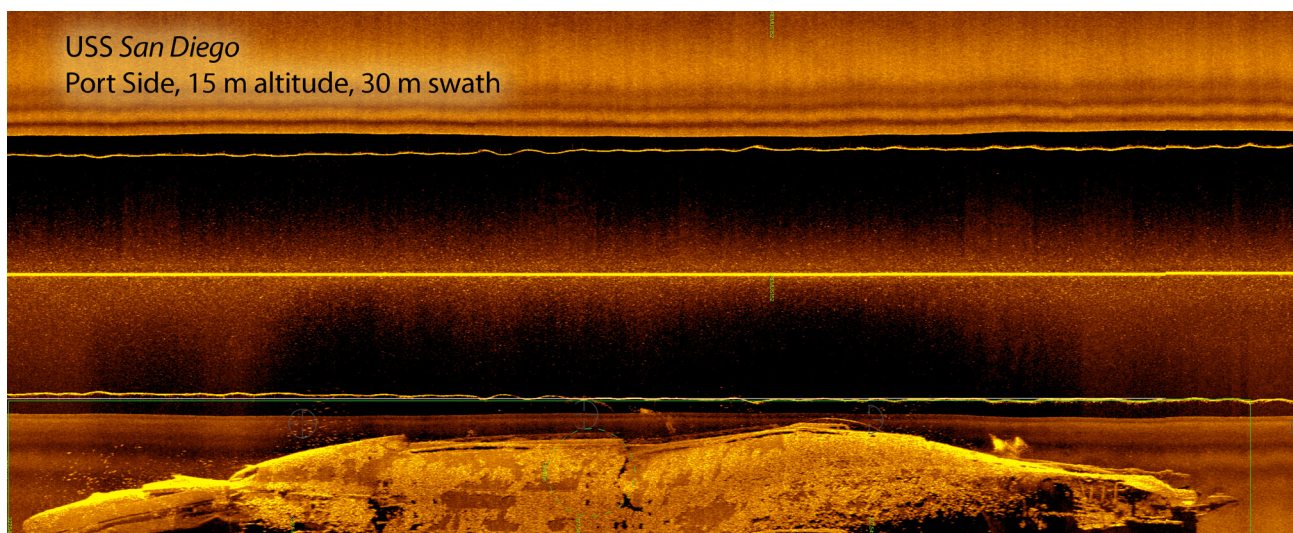


Figure 3. Processed side-scan sonar data collected over USS San Diego during the conduct of Autonomous Underwater Vehicle operations as part of the 2017 MDSU training mission. Data collected on the port side of the capsized wreck with the vehicle travelling at 15 m altitude from the seafloor. Bow faces left. (Mosaic illustration compiled by Heather Brown for NHHHC.)

new plaintiff in his place (Hess, 1996). Available documentation does not indicate how, but Hess found his new plaintiff in Bielenda's rival, Sal Arena, owner of Sea Hunter, Inc. (Orzech [2000?]:50). Despite Arena's entry into the lawsuit, Hess did not initiate any further court proceedings and Judge Spatt dismissed the case on 3 February 1997 (Rockafellow 1997).

Nomination of USS San Diego to the National Register of Historic Places

While the lawyers fought in court, the archaeologists at the Naval Historical Center followed up on the archaeological survey of *San Diego* by nominating the wreck site for inclusion in the NRHP.

In the nomination, drafted in January 1996, Dr. Orzech contended that the wreck site met several of the NRHP eligibility criteria, including:

- 1) Property is associated with events that have made a significant contribution to the broad patterns of our history.
- 2) Property embodies the distinctive characteristics of a type, period or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- 3) Property has yielded, or is likely to yield, information important in prehistory or history.

According to Orzech, "the construction of *San Diego* was a direct result of America's brief war with Spain in 1898. She and her sister cruisers enabled the

government to carry out a new and growing foreign policy of power projection into remote areas of the globe. Also, these warships represent a naval architecture design philosophy that filled an important gap in the transition from lightly-armed steel cruisers to the pre-World War I dreadnoughts." Furthermore, as a shipwreck, "*San Diego* affords us the opportunity to examine and study the tangible evidence of these policies and philosophies" (NPS, 1996:8,1).

On 19 July 1997, the 79th anniversary of the loss of *San Diego*, the Navy submitted the NRHP registration form, officially nominating the site for inclusion in the register. The National Park Service accepted the nomination and added *San Diego* to the NRHP on 17 February 1998 (Orzech [2000?]:51).

Recent Operations (2016–2017): Planning for the Centennial Commemoration of USS San Diego's Sinking

With the approaching centennial commemoration of *San Diego's* loss in 2018, the NHHHC, the descendent organization of the Naval Historical Center, elected to return to the wreck site in order to assess its current state of preservation and bring attention to the vessel's story, along with the role of the U.S. Navy in World War I. In preparation for a more comprehensive survey in September 2017, NHHHC partnered with MDSU-2 on two separate occasions in 2016 and 2017 to collect remote sensing data from *San Diego* and conduct limited dive training operations on the site. Between 14 and 15 August 2016, MDSU-2

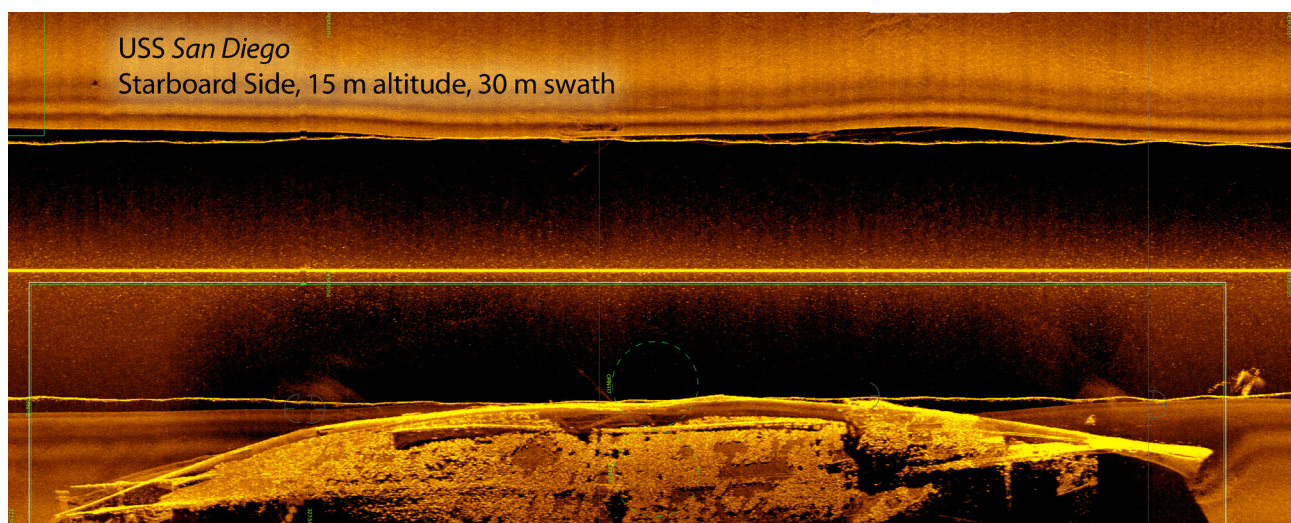


Figure 4. Processed side-scan sonar data collected over USS San Diego during the conduct of Autonomous Underwater Vehicle operations as part of the 2017 MDSU training mission. Data collected on the starboard side of the capsized wreck with the vehicle travelling at 15 m altitude from the seafloor. Bow faces right. (Mosaic illustration compiled by Heather Brown for NHHC.)

conducted a dive training and qualification mission over *San Diego* collecting surface-based side-scan sonar data and completing nine surface-supplied dives on the wreck (Catsambis 2016:1). This visit was followed up by a separate training mission in June 2017 which successfully captured high-resolution side-scan sonar data over the *San Diego* site through the use of an AUV (Figure 3 and Figure 4) (Heather Brown 2017: elec. comm.). These two training missions, albeit cursory, helped re-confirm the location, orientation, depth, and general condition of the wreck site, supporting planning operations for the September 2017 survey.

The wreck was found to lie fully capsized and maintained a significant degree of overall integrity, with its keel, bilge keels, and propeller shafts standing prominently proud of the hull. Neither propeller is still in position, having been removed by the aforementioned unauthorized salvage activities in the mid-1960s and mid-1970s. Data indicated that most of the superstructure that is not lying underneath the weather deck appears to have been pressed towards the starboard side of the vessel. A number of openings attributed to structural degradation were observed on the hull itself, most prominently along the starboard side of the vessel; however, data collected during the MDSU 2017 training exercise also indicated a clear area of deformation near midships on the port side. This is also generally the region where the external explosion that sank *San Diego* was reported, though the damage appears closer to midships than reported in the Court of Inquiry, which placed the explosion further aft near frame 78 (U.S. Navy 1918:86). Of concern was the fact that MDSU divers in 2016 observed easily accessible 6-inch shells near a parted seam in the vicinity of the port magazine. Approximately 31.5 m (103

ft.) bearing 240° off the starboard stern of *San Diego* lies an additional concentration of debris, provisionally identified as the sunken derrick that was associated with the unauthorized and unsuccessful salvage attempt of the propeller in 1974.

III. GEOGRAPHICAL AND ENVIRONMENTAL PARAMETERS

The site of *San Diego* is located approximately 8 nm off the southern coast of Fire Island, which serves as the southern barrier island for Long Island (Figure 5 and Figure 6). It is located approximately 18 nm from USCG Station Fire Island (1 Rescue Road, Babylon, NY 11702), which functioned as the September 2017 project's base of operations (Figure 7). According to observations taken during the MDSU 2016 training mission, the wrecked vessel itself is located in circa 30.5 m (100 ft.) to 33.5 m (110 ft.) of water, with its main axis running 345° and its bow facing towards shore. Soundings from the area collected by the National Ocean Survey in 1975 (Figure 8) and bathymetric data collected in 1998 and provided by the U.S. Geological Survey (Figure 9) are generally consistent with the depths observed during the MDSU 2016 training mission.

Similarly, based on observations recorded during the MDSU 2016 mission and United States Geologic Service data (Figure 10 and Figure 11), the wreck is resting on a sandy sea floor with little apparent growth and few if any rocky outcrops. Underwater visibility during the 2016 and 2017 MDSU training operations varied but extended up to about 10 m (33 ft.). During

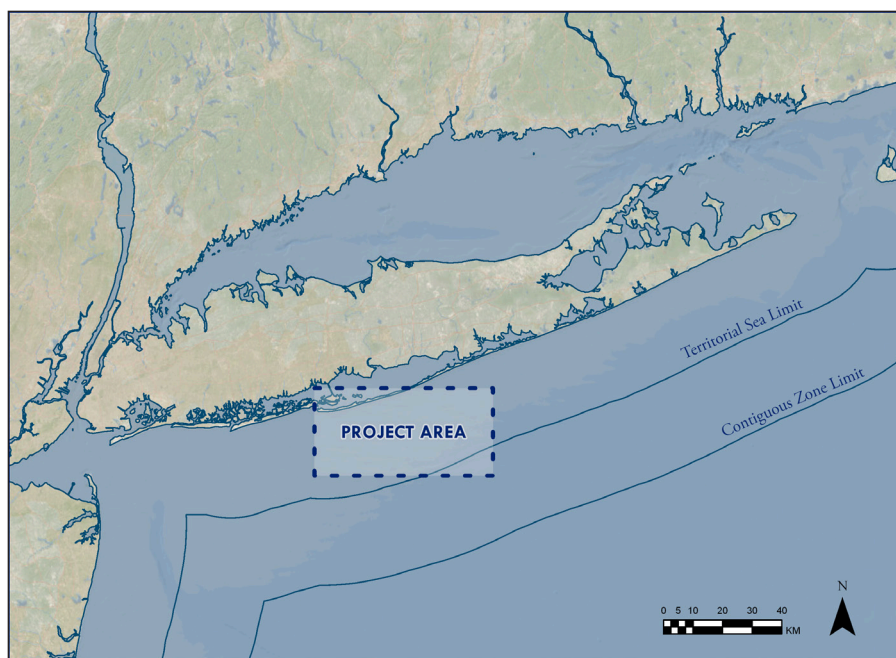


Figure 5. Map of Long Island, NY, indicating the area within which the USS San Diego survey operations will be conducted. (Cartographic data courtesy of ESRI Inc.)

the September 2017 mission, however, the visibility range was limited to between approximately 0.5 and 2 m (1.5–6.5 ft.), indicating that late summer algae blooms may have a notable effect on particulate matter in the water column.

During the scheduled period of field operations, between 11 September and 14 September, the sun rose approximately at 5:30 a.m. and set just after 6:00 p.m. Accordingly, the daily schedule of the survey aimed to conclude marine operations by 5:30–6:00 p.m. Regional temperatures for this period on land historically range between 58°F (14.5°C) and 76°F (24.5°C), though are generally somewhat cooler over water (Figure 12). Precipitation in the area is spread relatively evenly throughout the year and averages approximately 3.5 in. (9 cm) per month (Figure 13); the 2017 survey was not impacted by precipitation in any way. Sea conditions during the month of September approximately 20 nm south of the location of *San Diego* at Station 44025 indicate an average wind speed of 12 knots and an significant wave height of 1.4 m (c. 4.5 ft.) according to the National Data Buoy Center (Figure 14 and Figure 15)(NOAA 2017a). Observations taken during the survey were largely consistent with average trends.

September serves as the turning point where the optimal weather conditions of the summer months begin to deteriorate in the region, yet still provides conditions

that generally permit the conduct of successful operations. What had the greatest potential to disrupt the scheduled project was a tropical storm or hurricane as August through October constitute the peak season for such activity in the Atlantic basin (Figure 16) (NOAA 2017d). Indeed, Hurricanes Irma, Jose, and Maria all impacted the Atlantic coast of the United States in the days before, during, and after the survey, but fortunately did not affect operations.

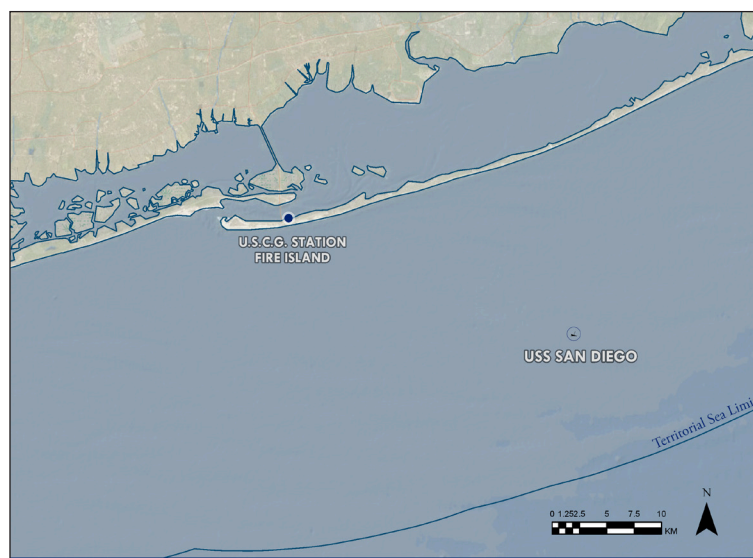


Figure 6. Approximate location of USS San Diego in relation to U.S. Coast Guard Station Fire Island. (Cartographic data courtesy of ESRI Inc.)



Figure 7. Satellite image of U.S. Coast Guard Station Fire Island, which will serve as the base of operations of the USS San Diego survey scheduled for September 2017. (Satellite image courtesy of Google Earth.)

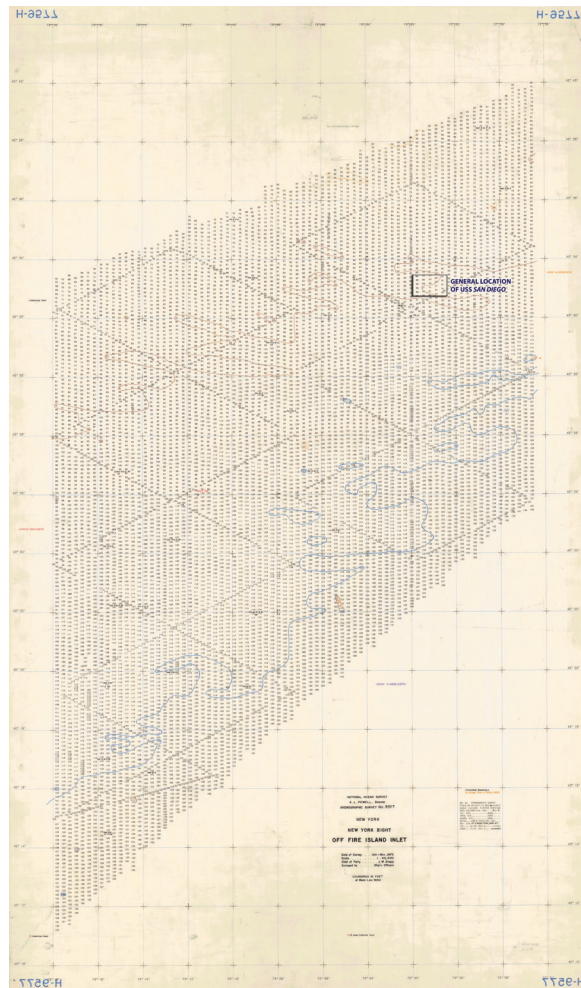


Figure 8. Hydrographic survey soundings (in feet) collected by the National Ocean Survey of the National Oceanic and Atmospheric Administration (NOAA) between October and November 1973 in the vicinity of the wreck site of USS San Diego. Indicates a depth between 89 and 92 ft. (27–28 m) in the general location of the wreck. (NOAA 1975.)

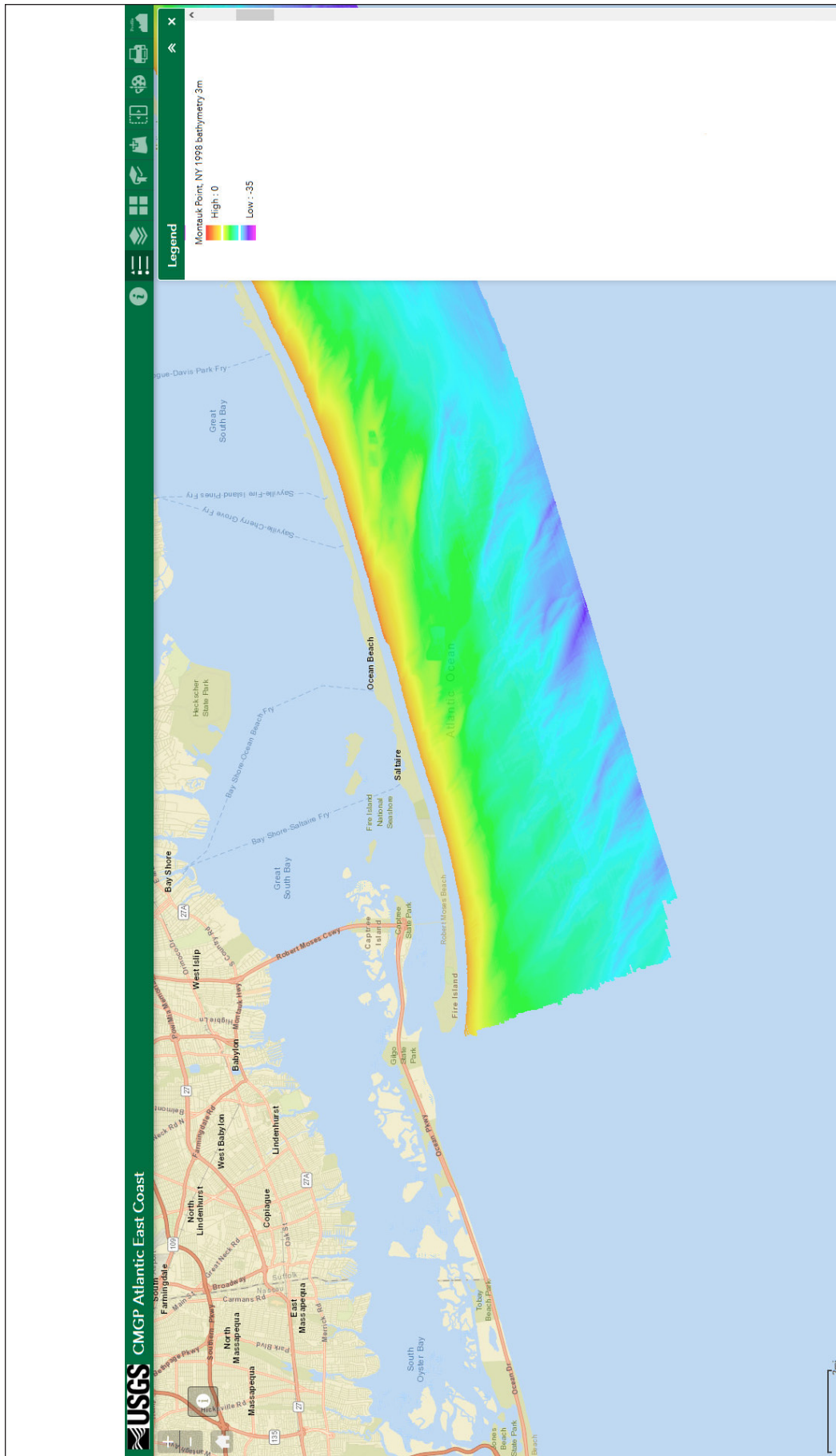


Figure 9. Excerpt of multibeam bathymetry data collected in 1998 by the U.S. Geological Survey's Coastal and Marine Geology Program south of Long Island, New York indicating the general geomorphology of the area just to the north of the USS San Diego site. Data indicates a gentle sloping depth profile from about 35 ft. (10.5 m) near shore to about 90 ft. (27.5 m) at the southern extent of the available data in the vicinity of the wreck site. (U.S. Geologic Survey 2011.)

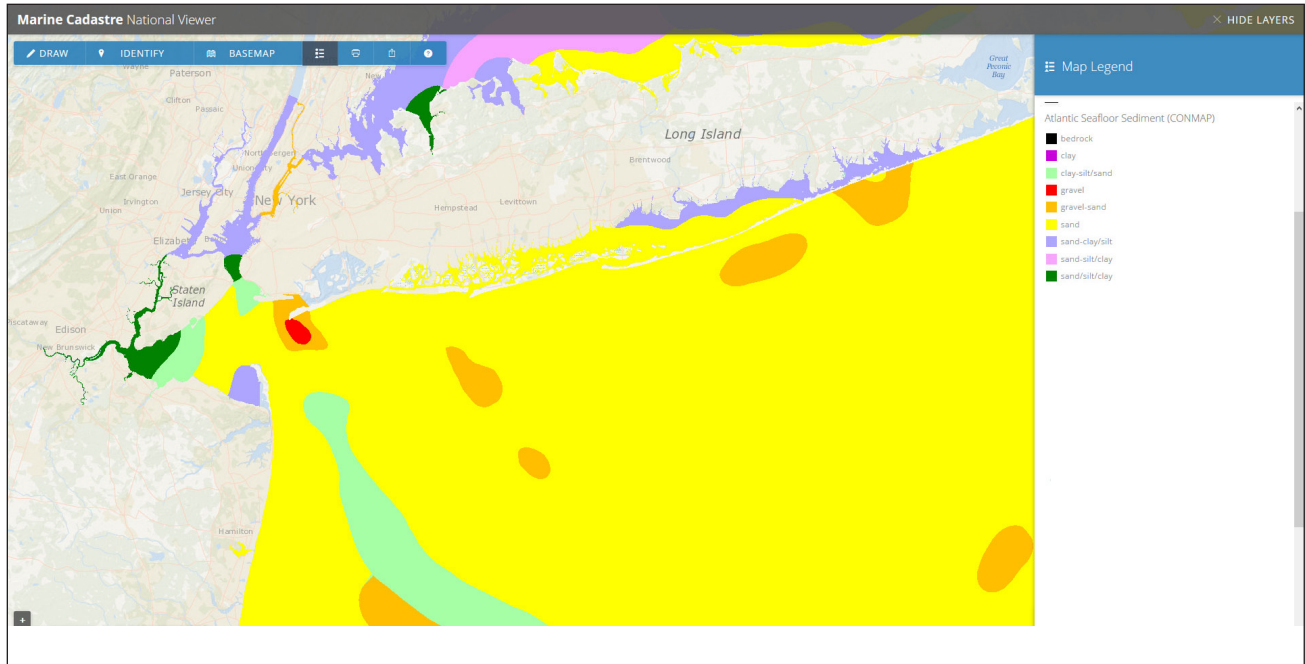


Figure 10. Compilation of grain-size data provided by the U.S. Geological Survey indicating a seafloor composed primarily of sand in the general area of USS San Diego. (U.S. Geologic Survey 2017b.)

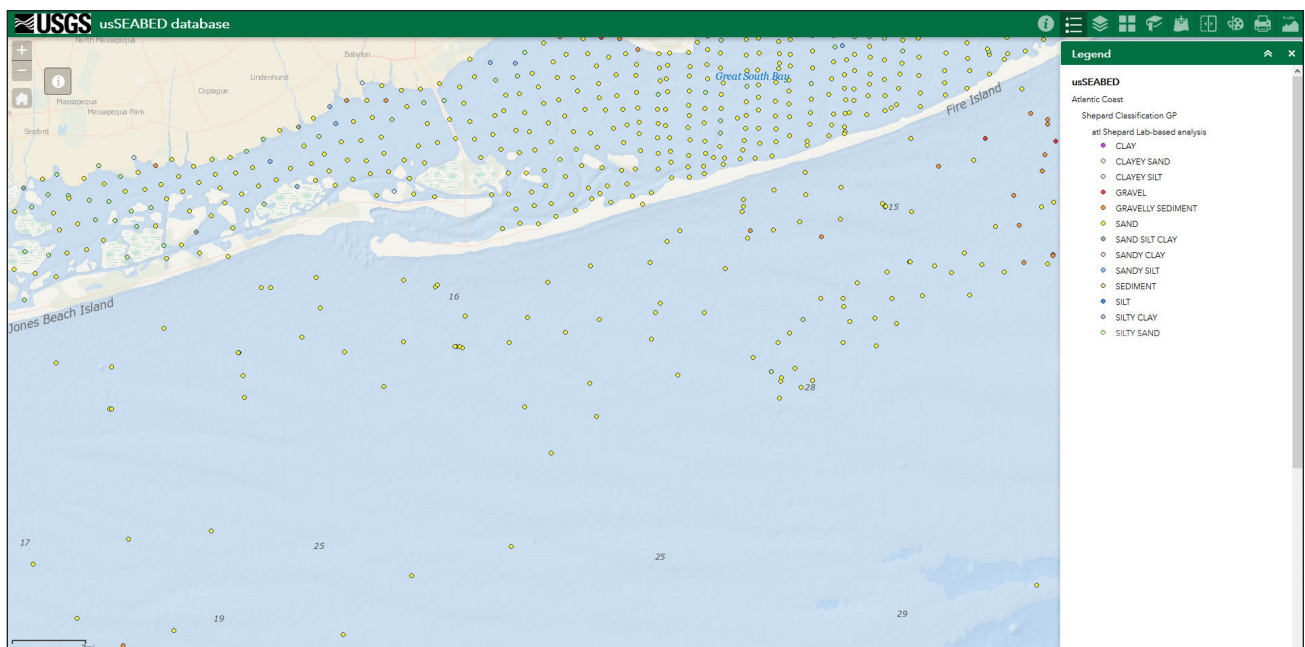


Figure 11. Seafloor classification data published by the Coastal and Marine Geology Program's usSEABED program indicating a sandy seafloor (yellow) with some silt and clay (green) in the vicinity of the USS San Diego site. (U.S. Geologic Survey 2017a.)

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	Sun																														
Rise (EST)	5:20	5:21	5:22	5:23	5:24	5:25	5:26	5:27	5:28	5:29	5:30	5:31	5:32	5:33	5:34	5:34	5:35	5:36	5:37	5:38	5:39	5:40	5:41	5:42	5:43	5:44	5:45	5:46	5:47	5:48	
Set (EST)	6:24	6:22	6:21	6:19	6:17	6:16	6:14	6:12	6:11	6:09	6:07	6:06	6:04	6:02	6:01	5:59	5:57	5:56	5:54	5:52	5:50	5:49	5:47	5:45	5:44	5:42	5:40	5:39	5:37	5:35	
	Temperature																														
Normal Max	78	78	78	77	77	77	77	76	76	76	76	75	75	74	74	74	73	73	73	72	72	71	71	71	70	70	69	69	69		
Normal Min	63	63	62	62	62	61	61	61	60	60	60	59	59	58	58	58	57	57	56	56	55	55	55	54	54	53	53	52	52	51	
Normal Mean	70	70	70	70	69	69	69	69	68	68	68	67	67	66	66	66	65	65	65	64	64	63	63	62	62	61	61	61	60		
Record High	93	88	91	91	90	90	92	91	91	89	88	90	89	83	84	88	87	81	83	82	82	83	86	83	87	79	86	80	81	82	
Record High Year	2010	2014	2015	1985	1985	1985	1998	2015	2016	1996	2013	2015	2005	2016	2008	1998	1991	2016	1985	2000	2016	2016	2005	2009	2010	2011	1998	2015	2015	1986	
Record Low	49	47	50	53	49	49	46	47	45	49	47	45	49	48	44	46	45	43	44	44	43	38	44	41	62	40	39	38	41	40	
Record Low Year	1991	1992	1991	1989	2000	2000	1988	1984	1986	1986	1995	1993	2006	1986	1986	2001	1986	1990	1990	1993	1991	1997	1998	1998	1992	1987	1989	1989	2000	2000	
Record Low Max	64	63	66	65	66	67	68	70	69	70	66	65	65	65	63	62	63	61	62	61	62	59	60	59	39	55	55	56	58	54	
Record Low Max Year	2002	2003	1986	1984	2000	1984	1984	1986	1997	2009	2009	1985	1985	1986	1984	1984	2013	1996	2004	1987	1991	1999	1995	1997	1997	2000	1984	1984	2000	2001	
Record High Min	74	74	74	71	74	75	73	71	75	73	71	70	70	71	73	71	73	69	69	70	71	71	67	67	62	68	69	70	66	70	
Record High Min Year	2013	2014	1993	2011	1985	1985	1999	2010	2015	2016	2013	2013	1995	2003	2005	1998	1991	2016	2016	2005	1989	1989	2011	2011	1992	2005	2007	2010	2015	2010	
	Accumulated Normal Degree Days																														
Month (Heating)	0	0	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	25	28	31	34	38	42	46	50	55	60	66	72	
Season (Heating)	6	12	17	22	27	32	37	41	45	49	53	57	60	63	66	69	72	74	76	78	80	82	84	85	86	87	88	89	90	91	
Month (Cooling)	0	0	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	25	28	31	34	38	42	46	50	55	60	66	72	
Season (Cooling)	684	690	695	700	705	710	715	719	723	727	731	735	738	741	744	747	750	752	754	756	758	760	762	763	764	765	766	767	768	769	
	Record																														
	Precipitation																														
Precipitation (Amount)	0.59	1.02	2.23	1.65	1.10	2.29	1.50	2.40	0.50	2.30	0.93	0.60	1.38	1.39	2.65	2.26	2.85	0.85	0.98	0.96	0.58	1.32	1.24	1.05	1.19	2.39	1.15	1.79	0.98	1.05	
Precipitation (Year)	1987	2002	1984	2012	1991	2008	2011	2004	2008	2015	2007	2009	1988	1984	2006	1999	1996	2004	2000	1988	2001	1994	2011	1996	1991	2008	2009	2004	2004	2001	
Snowfall (Amount)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Snowfall (Year)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Monthly Normals				Monthly Extremes			
Max Temperature	73.8°	Precipitation	3.58"	Warmest	70.9° - 2015	Wettest	7.46" - 2008
Min Temperature	57.5°	Snowfall	0.0"	Coolest	62.6° - 1984	Driest	0.81" - 1985
Mean Temperature	65.6°						

Figure 12. Weather almanac for the month of September compiled by the National Weather Service Forecast Office New York, NY for the location of Islip, NY, which serves as the datum location closest to the location of the USS San Diego site. Based on data recorded between 1981 and 2010, normal minimum and maximum temperatures between the 10th and 15th of the month range from of 58 to 76°F (21–15.5°C), and the sun rises at approximately 05:30 a.m., setting at approximately 6:30 p.m. (NOAA 2016.)

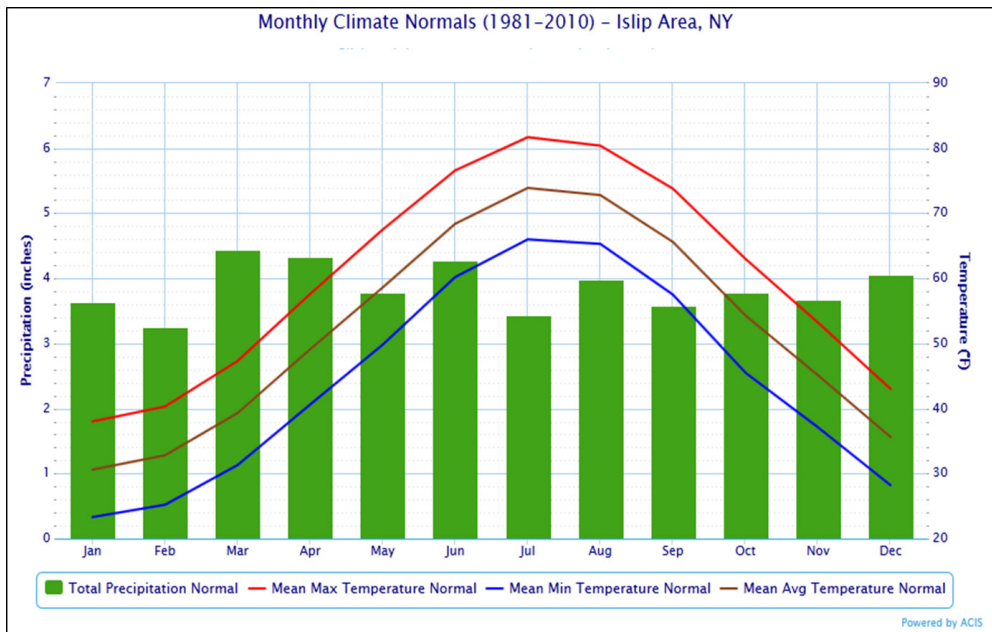


Figure 13. Monthly temperature and precipitation normals (1981-2010) compiled by the National Weather Service for the area of Islip, NY. In the month of September, precipitation aggregates to approximately 3.6 in. (9 cm). (NOAA 2010.)

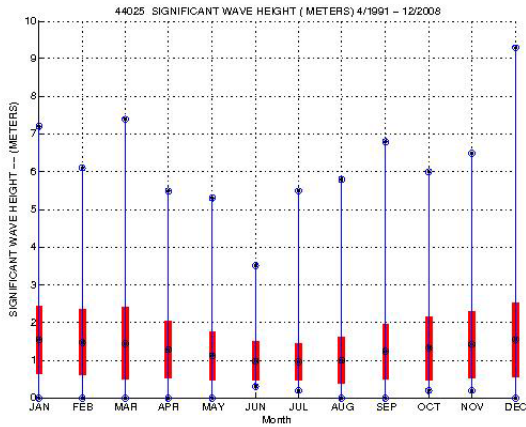


Figure 14. Climatic summary plot associated with National Data Buoy 44025, identifying mean and standard deviation plot for significant wave height between 04/1991 and 12/2008. Mean wave height for the month of September is almost 1.5 m (5 ft.), while significant wave height can approach 7 m (23 ft.). (NOAA 2017b.)

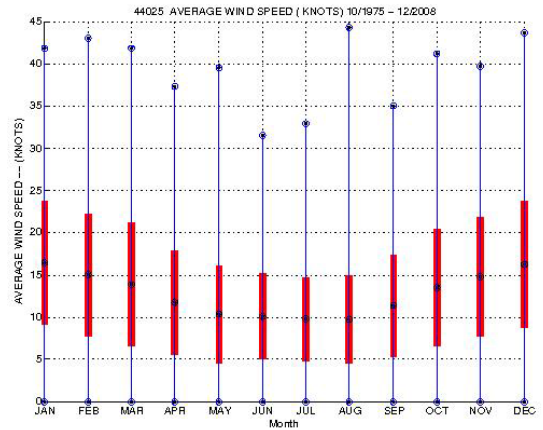


Figure 15. Climatic summary plot associated with National Data Buoy 44025, identifying mean and standard deviation plot for wind speed between 10/1975 and 12/2008. Mean wind speed for the month of September is approximately 12 knots, though the mean has been known to reach 35 knots. (NOAA 2017c.)

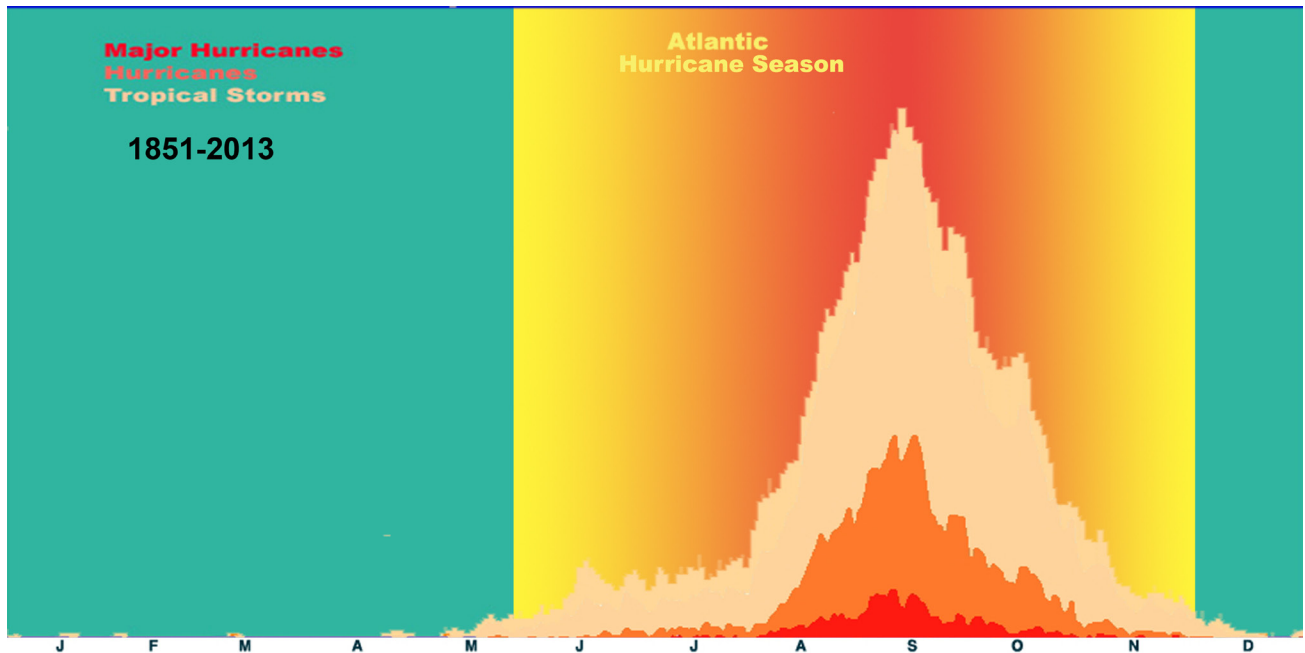


Figure 16. Illustration indicating the prevalence of tropical storms, hurricanes and major hurricanes in the Atlantic basin as compiled by the Hurricane Research Division of the Atlantic Oceanographic and Meteorological Laboratory for the period 1851–2013. Early September appears as the annual peak for prevalent storm-related activity, with a rather precipitous decline by the middle and end of the month. (NOAA 2013.)

IV. SCIENTIFIC FIELD METHODS & ACCOUNT OF OPERATION

Partners & Funding Sources

The September 2017 USS *San Diego* Survey included partners from the Underwater Archaeology Branch, the Histories Branch, and the Communication Branch of the NHHC, with each providing their respective area of expertise. NHHC operational funds supported the participation of team members from each branch in the field project, while the Underwater Archaeology Branch also contracted with the University of Delaware (UD) Coastal Sediments Hydrodynamics & Engineering Laboratory to serve as the key external partner. UD contributed hydrographic data collection expertise and offset the costs of field operations, including use of remote sensing instruments, the research platform R/V *Joanne Daiber*, and the participation of graduate students in the data gathering, processing, and interpretation phases. Additional project partners respectively funded their project participation, including the Naval Surface Warfare Center Carderock Division (NSWCC) Hull Response and Protection Branch and the Office of Naval Intelligence (ONI) Farragut Technical Analysis Center, both supporting field operations and lending expertise in data analysis and visualization efforts in the post-processing phase. The U.S. Naval Academy (USNA) Oceanography Department funded the participation of a midshipman who supported field operations, outreach efforts, and

data analysis. Finally, the USCG Station Fire Island graciously permitted *Joanne Daiber* to be based at the facility, along with additional field equipment, fee-free for the duration of the field project.

Personnel

Thirteen members, representing all aforementioned project partners, formed the research team that conducted the September 2017 field operations (Table 1). The field team was remotely supported in real-time by a number of additional project team members from the NHHC Underwater Archaeology, Histories, and Communication Branches based in Washington D.C.

Platform

As noted, the September 2017 survey of the *San Diego* site was conducted using UD’s research vessel *Joanne Daiber* as its platform of operations (Figure 17). Capable of a cruising speed of 18 knots and a range of 350 nautical miles, R/V *Joanne Daiber* measures approximately 46 ft. (14 m) in length, 16 ft. (5 m) in beam, with a draft of 4 ft. (1.2 m). The vessel is capable of carrying a maximum load of 18 passengers, in addition to 2 crew members, and was therefore able to accommodate the entire research team during the course of the recent survey operations. A *Seakeeper* computer-controlled gyroscope significantly reduced body roll on *Joanne Daiber*, which improved passenger

Table 1. Research Team Supporting the September 2017 USS San Diego Field Survey

NAME	ROLE	AFFILIATION
Peter Barron	Graduate Student	UD
Kevin Beam	Boat Captain	UD
Nolan Brandon	Midshipman	USNA
Alexis Catsambis	Co-PI (Archaeology)	NHHC
Matt Cheser	Naval Historian	NHHC
Kenneth Haulsee	Graduate Student	UD
Eric Lockwood	Mass Communications Specialist	NHHC
Ken Nahshon	Research Engineer	NSWCC
George Schwarz	Archaeologist	NHHC
Art Trembanis	Co-PI (Oceanography)	UD
Dave Wilson	Research Engineer	NSWCC
	Visualization Specialist	ONI
	Visualization Specialist	ONI



Figure 17. University of Delaware Research Vessel Joanne Daiber with the Edgetech 6205 sensor suspended over the water off the vessel's port quarter. (Image courtesy of the University of Delaware.)

comfort and lessened data distortion during hull-mounted sonar data collection.

Methods & Tools

Three primary remote sensing instruments were utilized during the survey—hull-mounted and vehicle-mounted acoustic sensors, as well as vehicle-mounted camera sensors. These were complemented by supporting equipment such as a conductivity temperature and depth (CTD) sensor and a drop camera, which consisted of a high-definition camera with illumination suspended via cable from the rear deck of the surface vessel.

Mounted on the port side of *Joanne Daiber*, an Edgetech 6205 sensor served as a combined swath bathymetry and dual-frequency side-scan sonar (230/550 kHz) (Edgetech 2015). The unit is able to co-register the two data streams during surface survey operations, and includes an integrated sound velocity sensor.

A UD-customized GAVIA AUV was equipped with a dual-frequency side-scan sonar (900/1800 kHz), a Geoswath *Phase Measuring Bathymetric Sonar* (500 kHz), as well as a color camera with strobe illumination (Figure 18). The AUV has a 500 m (1640 ft.) depth rating and is able to run approximately 4 hours on a

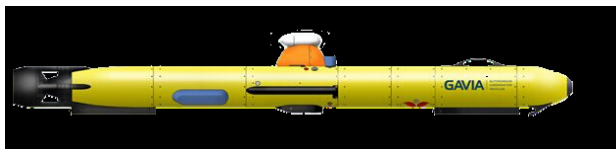


Figure 18. GAVIA Autonomous Underwater Vehicle similar to the one customized by University of Delaware and utilized in the investigation of the USS San Diego wreck site. (Image courtesy of GAVIA.)

single battery charge, which never limited desired operations during the 2017 survey. Wireless communications with the surface permitted the AUV to receive and transmit data without necessitating the need for vehicle recovery, thereby increasing operational efficiency. For deployment and recovery purposes, *Joanne Daiber's* stern is equipped with a dedicated extendable A-frame.

The final sensor deployed during the survey was an Outland 1000 remotely operated vehicle (ROV) operated by UD (Figure 19). Rated to 300 m (c. 1000 ft.), it carries several cameras, including a low light black & white and a high resolution color instrument. The ROV is also equipped with high-powered LED lights, a multibeam imaging sonar (700 kHz) and an ultra-short baseline (USBL) tracking system.



Figure 19. Outland 1000 Remotely Operated Vehicle similar to the one to be utilized by University of Delaware in the investigation of the USS San Diego wreck site. (Image courtesy of Outland.)

Operations

The 2017 USS *San Diego* Survey was conducted between 10 and 15 September, with first and last days serving as mobilization and demobilization days respectively. Adverse weather did not impact operations, despite the mission being conducted during the peak of hurricane season, allowing for each vehicle deployment and collection to be completed as planned. Any technical issues were overcome during the course of operations, ultimately resulting in equipment that performed as anticipated, successfully collecting a significant amount of remote sensing data.

A total of 10 AUV missions and 15 Edgetech 6205 survey lanes resulted in over 15 GB of associated acoustic data and excellent data coverage over the wreck site. Figure 20 and Figure 21 partially illustrate the data coverage of *San Diego* as collected through the hull-mounted Edgetech 6205 sensor, while Figure 22 is indicative of the AUV mission coverage, representing data collected on two of the missions. Vis-

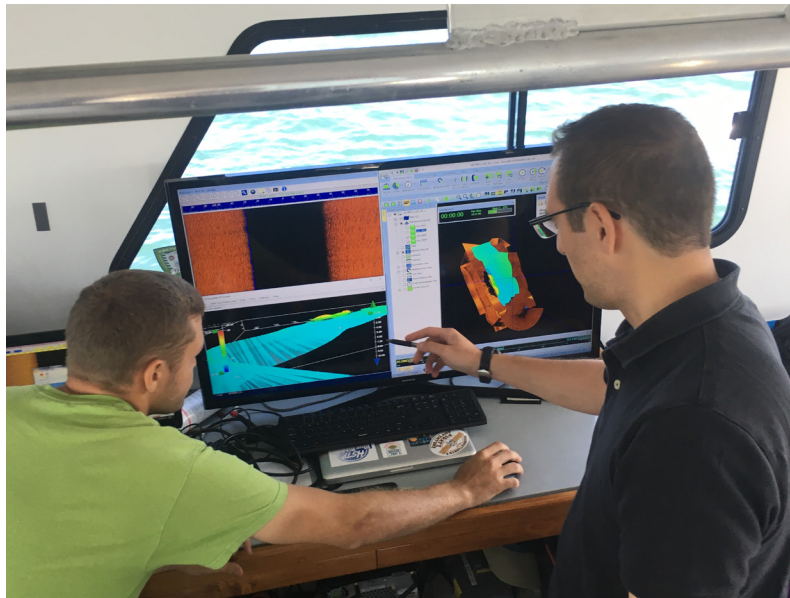


Figure 20. Dr. Alexis Catsambis, project co-Director, examines the Edgetech 6205 bathymetry and side scan sonar data over the site of USS San Diego as it is in the process of being collected. (Photograph by Dr. George Schwarz, NHHC.)

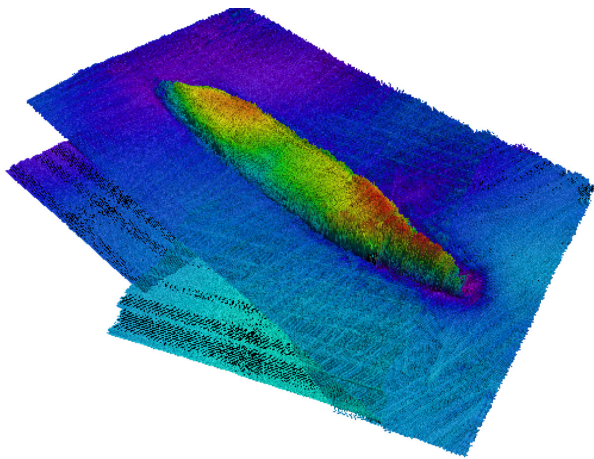


Figure 21. Seen here is a pre-processed series of bathymetric data in the form of a three-dimensional point cloud reflecting some of the survey passes conducted over USS San Diego with the hull-mounted Edgetech 6205 sensor during the course of the 2017 survey. (Illustration prepared by the University of Delaware.)

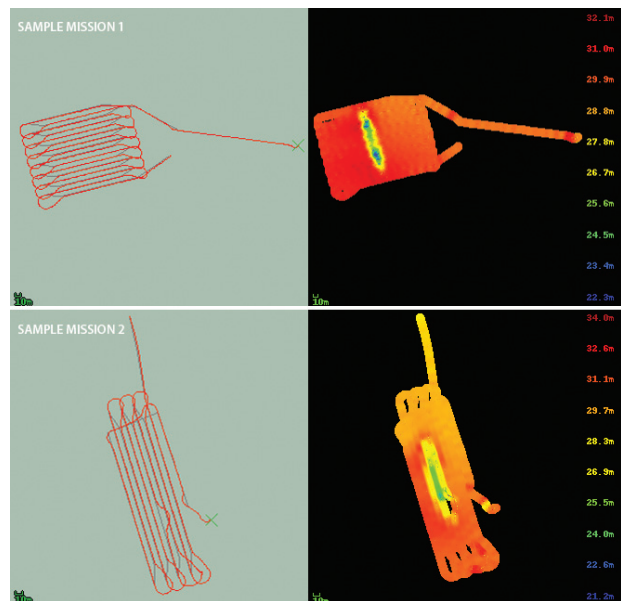


Figure 22. Sample AUV mission navigation lanes as planned before AUV deployment (left) and acoustic data coverage over the site of USS San Diego following the associated AUV sample missions (right). (Underlying data illustrations prepared by the University of Delaware.)



Figure 23. Overview of the ROV control environment, with pilot and project co-Director Dr. Art Trembanis (left) navigating the vehicle through limited underwater visibility as captured in the monitor feed (right). (Photograph by Dr. George Schwarz, NHHC.)

ibility, however, which at times ranged between 20 and 30 cm (c. 8–12 in.), substantively limited the value of visual data captured through the use of the ROV and AUV (Figure 23). It was therefore not possible to attempt a photo-mosaic of the site or document in detail the areas of suspected damage associated with the sinking. The ROV did, however, capture additional multibeam data that can be used to complement the overall acoustic data set (Figure 24). UD was also able to procure high definition areal footage of survey oper-

ations through the use of a small commercial drone (Figure 25).

Upon accomplishment of the survey's primary objectives, USCG Station Fire Island personnel were invited aboard *Joanne Daiber* for an equipment demonstration in appreciation of the exceptional support provided to the team (Figure 26). What follows below in Table 2 is a summary of each day's operations during the survey. A full account of operations can be found in the mission log (Appendix C).

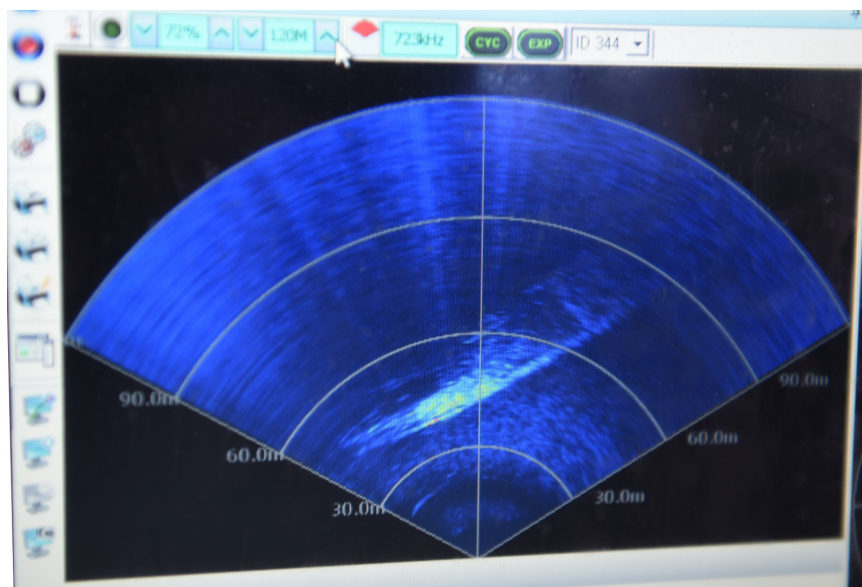


Figure 24. Acoustic data collected through the 700 kHz ROV-mounted multibeam sonar sensor imaging the stern port quarter of USS San Diego. (Photograph by Dr. George Schwarz, NHHC.)

Table 2. Summary of Operations During the 2017 USS San Diego Field Survey.

DATE	DAILY SUMMARY
10 SEP	Mobilization day; NHHHC, UD, NSWCC, ONI, USNA arrived in Commack, NY. R/V <i>Joanne Daiber</i> arrived and docked at USCG Station Fire Island. Equipment setup and vessel orientation ensued.
11 SEP	Technical issue with Edgetech 6205 sonar led to revision of original plan to conduct surface-based survey operations. Re-located <i>San Diego</i> site and completed 8 successful AUV missions utilizing data from the MDSU 2017 survey as a baseline. Drop camera indicated visibility was in the 2 meter range.
12 SEP	Launched ROV survey operations over port stern quarter of San Diego; hindered by limited visibility and technical feed issues. Provided assistance to incapacitated fishing vessel and returned to USCG Station Fire Island early to install repaired Edgetech 6205 sonar and improve ROV video feed.
13 SEP	Utilizing the re-installed hull-mounted Edgetech 6205, collected bathymetric and side-scan sonar data over the site of <i>San Diego</i> from 15 individual survey lanes oriented along multiple headings. Launched ROV operations using drop camera mounted on vehicle to improve high-definition feed; poor visibility (20–30 cm) inhibited effective examination of damaged areas of wreck. However, ROV collected multibeam data from the vehicle-mounted sensor. Launched two additional AUV missions successfully collecting additional sonar and point cloud data from wreck site.
14 SEP	Provided USCG Station Fire Island personnel with tour of <i>Joanne Daiber</i> and demonstration of associated remote sensing equipment by mapping the seafloor from the Station to the inlet along the established ship channel. Organized and exchanged survey data, removed equipment from vessel, prepared for return transit, and held mission debrief meeting.
15 SEP	NHHHC, UD, NSWCC, ONI, USNA departed Commack, NY. <i>Joanne Daiber</i> departed USCG Station Fire Island returning to Lewes, Delaware.

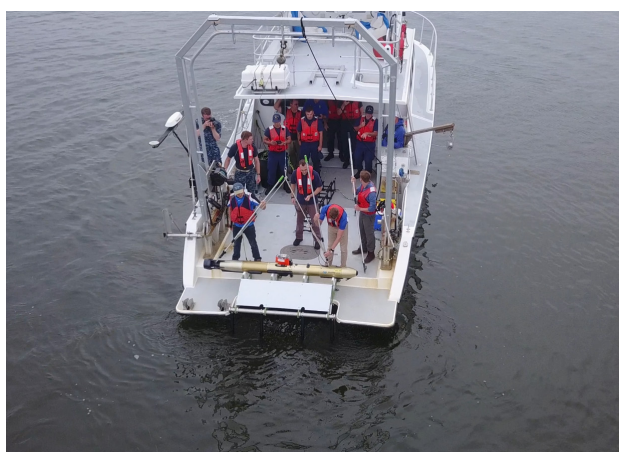


Figure 25. Still of AUV deployment operations as captured by University of Delaware aerial drone. (Photograph by Dr. Art Trembanis, University of Delaware.)



Figure 26. Project co-Director Dr. Art Trembanis (foreground, left) providing personnel of USCG Station Fire Island with an overview of the capabilities of the AUV utilized during the 2017 USS San Diego survey, as NHHHC Archaeologists Dr. George Schwarz (left) and Dr. Alexis Catsambis (right) look on. (Photograph by MC1 Eric Lockwood, NHHHC.)

Site Restoration

As intended, the applied methodology did not disturb the site of *San Diego* or its surrounding physical environment, and accordingly there was no requirement for site restoration procedures following the operation.

V. CONSERVATION & CURATION

As intended, no disturbance or recovery of artifacts from the site of *San Diego* was undertaken during the conduct of the September 2017 USS *San Diego* Survey. Accordingly, there are no associated artifact conservation or curation responsibilities associated with the remote sensing survey. The data collected will be curated by the Naval History and Heritage Command's Underwater Archaeology Branch.

VI. PROJECT OUTREACH PRODUCTS

The September 2017 *San Diego* Survey was undertaken as part of an effort to contribute to the upcoming 2018 centennial commemoration of the sinking of the vessel. Accordingly, raising public awareness was a significant element of the recently completed project. A number of press interviews were granted during and immediately after the survey, with articles appearing both online and in printed newspapers. A series of more comprehensive outreach products are anticipated in the spring and summer 2018.

Completed outreach products:

- 1) A press release was issued by NHHC in advance of the operation on 6 September 2017 to bring attention to the project: http://www.navy.mil/submit/display.asp?story_id=102288.
- 2) A series of media stories associated with the project were published during and shortly after the conduct of operations, facilitated by interviews provided by NHHC and UD project participants (Figure 27). A compilation of media stories prepared by NHHC Communication Branch on 9/26/2017 appears as Appendix D.
- 3) Nearly 650 photographs and 80 video files were captured by NHHC in the course of operations, 18 of which were released during the project for media purposes on the Defense Video & Imagery Distribution System: <https://www.dvidshub.net/>.

- 4) A blog on the project was prepared and published on the Sextant by Midshipman Nolan T. Brandon: <http://usnhistory.navylive.dodlive.mil/2017/09/13/surveying-sunken-wwi-ship-uss-san-diego/>.
- 5) A virtual three-dimensional model of the original hull of USS *San Diego* was produced by NSWCC, which is anticipated to be used for both analytical and outreach purposes.
- 6) Upon conclusion of survey operations, USCG Station Fire Island personnel were provided with a brief on the project and a demonstration of the technical capabilities of R/V *Joanne Daiber*.
- 7) The NHHC Underwater Archaeology Branch website page dedicated to USS *San Diego* has been updated (<https://www.history.navy.mil/research/underwater-archaeology/sites-and-projects/ship-wrecksites/san-diego-cruiser-6.html>) and a virtual catalog of artifacts from the vessel in the Branch collection has been launched (https://www.history.navy.mil/research/underwater-archaeology/conservation-and-curation/ua-artifact-collections/san_diego_artifact_collection.html).
- 8) The present technical report on the mission produced by NHHC is available for researchers.



Figure 27. Project co-Director Dr. Alexis Catsambis (right) in the process of being interviewed by the San Diego Union-Tribune while being recorded by MC1 Eric Lockwood (left). (Photograph by Dr. George Schwarz, NHHC.)

Anticipated outreach products:

- 1) Artifacts from USS *San Diego* in the NHHC Underwater Archaeology Branch collection will be placed on loan with the Naval War College Museum as part of an exhibit commemorating World War I in the fall of 2017.
- 2) One professional conference paper (January 2018, Society for Historical Archaeology) and one public lecture (March 2018, Archaeological Institute of America) will present preliminary results of the survey.
- 3) A three-dimensional visualization of the wreck site of *San Diego* will be produced by UD and ONI, which will be used for both outreach purposes and scientific analyses.
- 4) A comprehensive technical report discussing analysis of findings is anticipated in late spring of 2018.
- 5) A press release detailing the survey's findings will accompany the publication of the report.
- 6) Should scientific findings merit, an article will be submitted for publication in a peer-reviewed journal.
- 7) Defense Media Activity is in the process of preparing a series of vignettes on the USS *San Diego* survey project.
- 8) An on-site commemoration on the centennial of USS *San Diego*'s sinking is expected in July 2018.

The field survey also provided a valuable training opportunity in advanced hydrographic data collection operations for project participants from NHHC, NSWCC, ONI, USNA, and USCG. The data are now undergoing processing and visualization and will be used in the development of the first empirically-derived site plan of the wreck, and subsequent analysis and interpretation phases.

Though metrics are unavailable to assess the impact of the media coverage afforded to the project, the quality and extent of the associated publications provides positive indications that the project has thus far also met its outreach objectives. Beyond press coverage, the public outreach products anticipated to have been completed at this stage have been launched, positioning the project to succeed in its mission of utilizing the USS *San Diego* project as an opportunity to raise public awareness of the vessel and the role of the U.S. Navy in the Great War.

Recommendations will be reserved until data processing, analysis, and interpretation phases are complete and will be presented in the project's final report, scheduled to be completed in late spring 2018.

VII. PERMITTING REQUIREMENTS

As the site of USS *San Diego* is located 8 nm from shore outside state waters and no intrusive work was planned or undertaken, no additional permitting requirements were identified. A courtesy call was placed on 13 August 2017 to the New York State Historic Preservation Office to apprise the Archeology Unit of the upcoming survey. A courtesy copy of this report will be submitted to the Archeology Unit for informational purposes.

VIII. CONCLUSIONS & RECOMMENDATIONS

The 2017 USS *San Diego* Survey was able to leverage a multi-disciplinary partnership to collect a substantive amount of new information over the site of the World War I armored cruiser. Though limited by visibility in terms of quality of visual data collected, the amount of acoustic data captured through side-scan sonar and bathymetric sensors exceeded expectations.

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APPENDIX A
EXCERPT FROM PROCEEDINGS OF USS *SAN DIEGO* COURT OF INQUIRY

Record of Proceedings of a Court of Inquiry Convened on board U.S.S. Maui by order of the Commander Cruiser and Transport Force to Inquire Into the Circumstances Concerning the Tolls of U.S.S. San Diego July 19, 1918 [Excerpt PG 86–89]:

“The court, having thoroughly inquired into all the facts and circumstances connected with the loss of the U.S.S. SAN DIEGO, and having considered the evidence adduced, finds as follows:-

FACTS.

1. That the U.S.S. SAN DEIGO [sic], under the command of Captain H.H. Christie [sic] U.S. Navy, was making passage from Portsmouth, N.H. to New York, N.Y. and that at or about 11:05 a.m. 19 July, 1918, she was in approximate position Latitude 40° 30” north, Longitude 73° 0” west, on base course 304 true, and zig zagging by an approved plan, speed 15 knots.

2. That on leaving Portsmouth, at about 10:00 a.m. 18 July, 1918, her loaded condition was as follows; coal 29,000 tons, of this amount there were 90 tons on boat deck; 185 tons on main deck; 270 tons in the four forward fire rooms: the remainder was in the coal bunkers and coal shuts: all fresh water bottoms full. During the voyage there were expended 156 tons of coal, taken equally from the lower bunkers and 550 tons of water. The Captain was justified in having on board this extra coal, stowed as it was, for the reason that he was under orders for distant service which require the carrying of this extra coal.

3. That the captain was steering a safe and proper course at the time to minimize the submarine and mine dangers in these waters.

4. That a careful inspection watch had been maintained while last coaling ship to prevent the introduction of any foreign matter in the coal bunkers.

5. That all lookouts, gun watches, fire control parties, etc. as prescribed by the “Orders for ships in Convoy” of the Commander Cruiser and Transport Force, were at their stations and on the alert.

6. That all reasonable and necessary orders to safeguard the watertight integrity of the ship in dangerous waters had been given and were being carried out.

7. That at or about 11:05 a.m. 19 July, 1918, an explosion took place in proximity of the skin of the ship, at about Frame No. 78, on the port side and well below the water line.

8. There is no conclusive evidence that a submarine, torpedo, or periscope was sighted, although fire was opened on suspicious objects.

9. That as a result of this explosion the ship began to list to port and that she finally rolled over and sank bottom-up at about 11:25 a.m. 19th July, 1918.

10. That the explosion was an exterior one and as a result of this explosion the skin of the ship was ruptured in the vicinity of bulkhead No. 78, at the level of the port engine room; and bulkhead No. 78 was so deformed

that watertight door No. 142, between the port engine room and No. 8 fire room, was opened to the ingress of water to No. 8 fire room.

11. That the effect of this rupture was to immediately fill the port engine room and adjacent compartments, and that No. 8 fire room was soon filled also.

12. That the effect of this water would give the ship a list of 17-1/2 degrees to port.

13. That with the increased displacement water entered through 6-inch gun port No.10, which was justifiable open to permit using that gun, when the ship had listed 9-1/2 degrees. That this resulted in flooding the gun deck and accelerated the heeling of the ship and her final capsizing.

14. That relatively small quantities of water entered the upper dynamo room (compartment A-34) through non-watertight voice tubes, but that this had no appreciable effect on the sinking of the ship.

15. That the captain properly withheld the order to abandon ship until he was certain that the ship would capsize and sink.

16. That the ship was abandoned in good order, and excellent discipline prevailed. Gun crews remained at their guns and continued firing at all suspicious objects until they were forced to jump into the water. That the captain was the last to leave the ship.

17. That the radio apparatus was put out of commission by the explosion.

18. That as no radio reports of this disaster had been sent, Lieutenant C.J. Bright, U.S. Navy, was ordered to proceed with a dinghy crew to Long Island to report the disaster and request rescue vessels. That this boat reached shore safely and carried out its orders.

19. That the steamships "Malden" Captain Brown, "Bussun" Captain Brewer and "F.P. Jones" Captain Dodge, hove in sight later and rescued the men in the water and transported them to New York.

20. That the captains of these steamers showed courage and a splendid spirit in taking their ships into these waters, where a submarine had apparently been operating, and deserve commendation for their actions and it is recommended that suitable acknowledgment be made by the Navy Department of their gallantry.

21. That on the day subsequent to this disaster six contact mines were located by the Naval Forces in the vicinity of the position where the disaster to the U.S.S. SANDEIGO [sic] occurred.

22. That the following injuries to personnel occurred as a result of this disaster; Elam, Warren Aca, Fireman 3rd class, contusion left foot; Dougherty, John Edward, Yeoman 2nd class, contusion left great toe; Culpepper, Harris Huff, Fireman 3rd class, synovitis right knee joint; McAfee, Oscar, Engineman 2nd class, burns, both hands; Keesee, William Fireman 2nd class, cramps; and Whack, U.J., Seaman, sun burns

23. That the following loss of life occurred incident to the loss of the ship: Blaine, Clyde, C. Fireman 1st class, U.S. Navy; Davis Thos. E. Engineman 2nd class, U.S. Navy; Harris, Paul J. Seaman 2nd class, U.S. Navy; Munson, Andrew, Machinist's Mate 2nd class, U.S. Navy; Rochet, Jas. F. Engineman 2nd class, U.S.N.R.F.; and Thomas, Frazier O., Machinist's Mate 2nd class, U.S. Navy.

24. That the ship and equipment are a total loss to the United states with the exception of the following items which were salvaged: two whate-boats [sic], a dinghy, a wherry, an unknown number of life preservers, a few life rafts, \$20,305.00 in currency, smooth return for the 4th quarter of the fiscal year 1917-1918, with the exception of the provision return and the Marine rolls, and one "radio calls" and one "Radicode" book.

OPINION.

1. That the loss of the U.S.S. SAN DEIGO [sic] was due to an external explosion of a mine.

2. That the loss of the ship, loss of life, and injury to personnel incurred, was in no way due to any negligence, failure to take proper precautions or inefficiency of the captain or any of the personnel of the ship.

3. That the loss of life and injury to personnel was incurred in the line of duty and was in no way due to their own mis-conduct.

4. That at the time of the disaster and thereafter, the conduct of the captain, officers and crew was in the highest degree commendable, and that the remarkably small loss of life was due to the high state of disciplined maintained on board.

5. That no officer should be held responsible for the loss of funds or property for which he was accountable.

6. That no further proceedings should be held in this case.

The court having finished [sic] the inquiry, then at 3:20 p.m., adjourned to await the action of the convening authority.

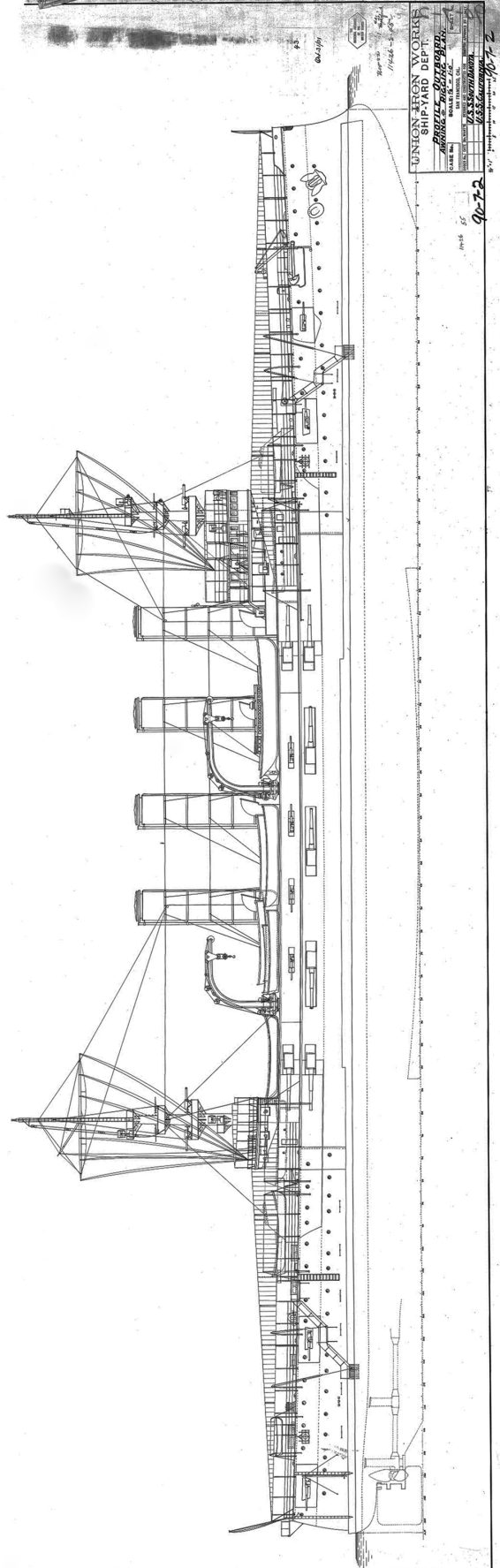
[SIGNED: M. Johnston]
Rear Admiral, U.S. Navy, President

[SIGNED]
Commander, U.S. Navy, Judgg [sic] Advocate”

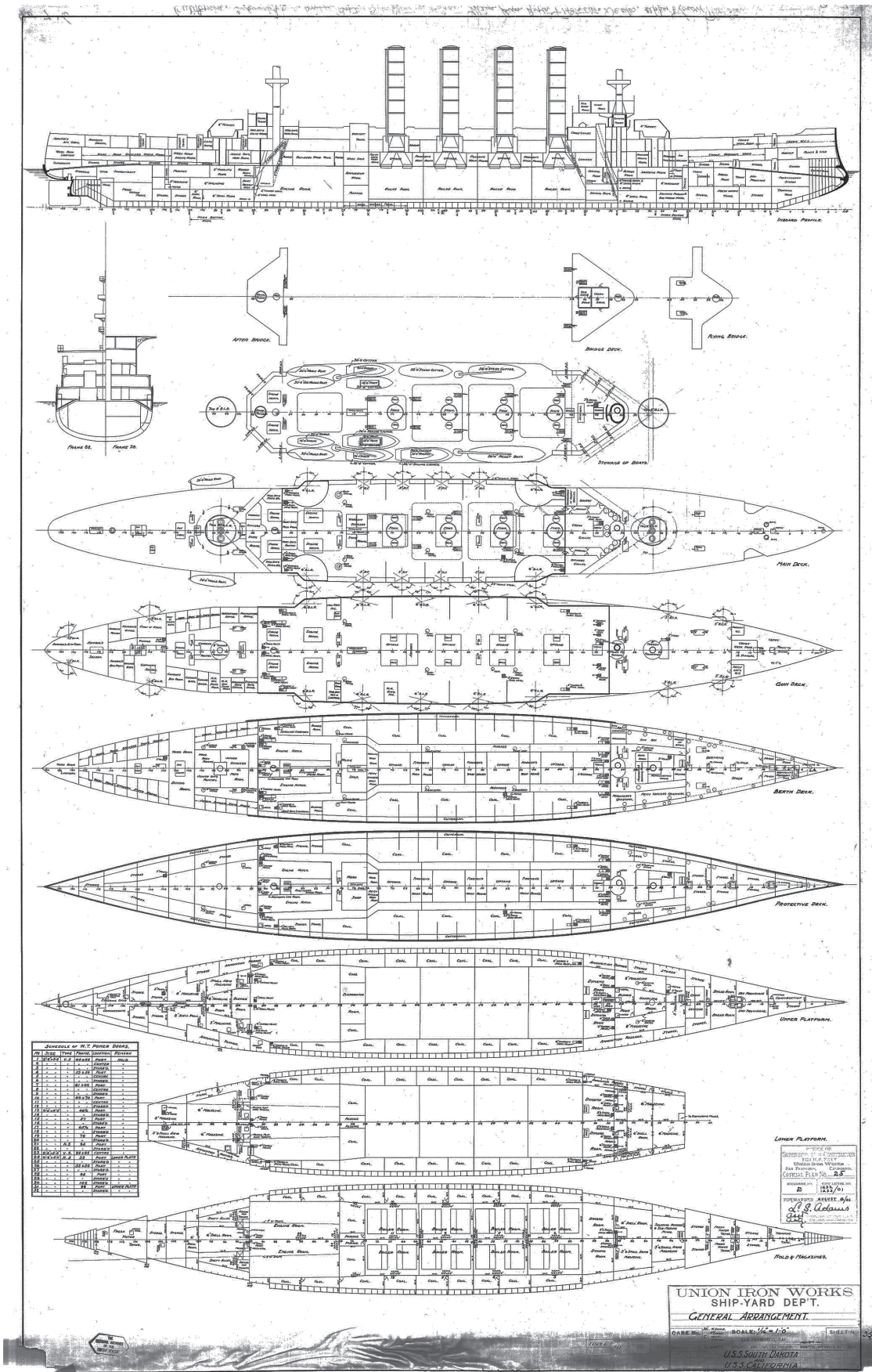
APPENDIX B
SELECTED USS *SAN DIEGO* SHIP PLANS

Plans from Record Group 19, Bureau of Ships, Dash Files, located at the National Archives and Records Administration, Cartographic Section, College Park, MD

- 1) Outboard Profile Plan (NARA 90-7-2)
- 2) General Arrangement Plan (NARA 90-7-6)
- 3) Booklet of General Plans – Corrected to Suit Ship 1917 (116-15-20)



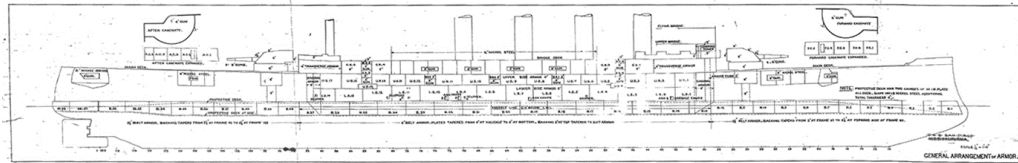
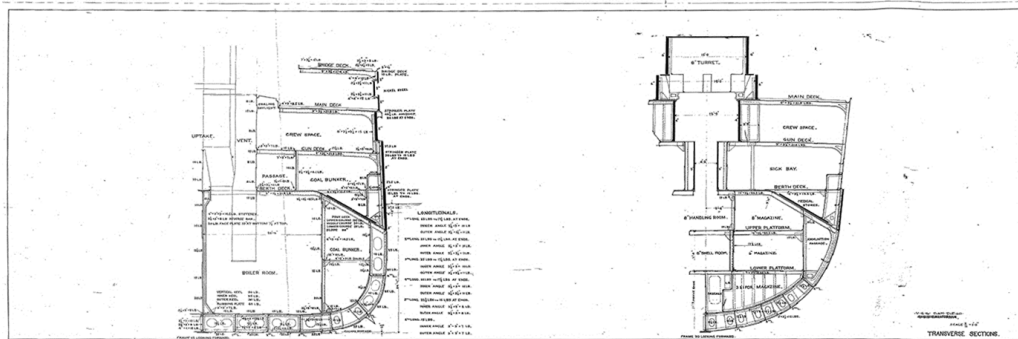
Outboard Profile Plan (NARA 90-7-2)



General Arrangement Plan (NARA 90-7-6)

SAN DIEGO
U.S.S. CALIFORNIA
ARMORED CRUISER.

<p>CONNECTIONS TO SHIP</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DESCRIPTION	DATE							<p>BOOKLET OF GENERAL PLANS</p> <p>PREPARED BY THE BUREAU OF NAVAL ARCHITECTURE, U.S. NAVY DEPARTMENT, WASHINGTON, D.C.</p> <p>NO. 116-15-20</p>
NO.	DESCRIPTION	DATE								



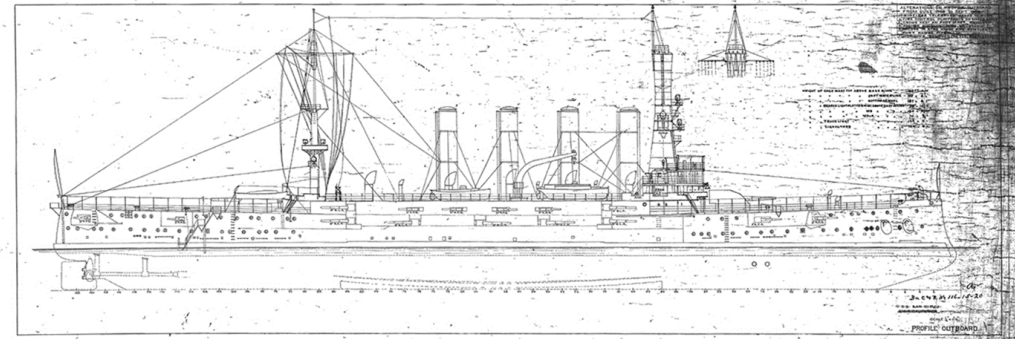
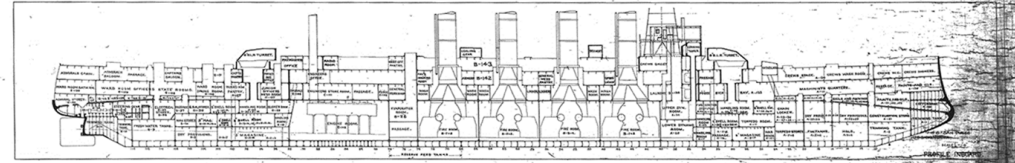
CAPACITIES OF DOUBLE BOTTOM COMPARTMENTS				CAPACITIES OF W. TANKS				CAPACITIES OF TRIMMING TANKS				GENERAL INFORMATION				FIRE PLUGS				SMALL BOATS				NEW				ORIGINAL BUNKERS				OFFICERS			
COMP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.	NO.	MEASUREMENTS	TOTAL CAP.		
<p>GRAVITY TANKS:</p> <p>BATTERY:</p> <p>HEIGHTS:</p>																																			

U.S.S. SAN DIEGO
U.S.S. CALIFORNIA

CORRECTED TO SUIT SHIP

OCTOBER 11, 1917

NAVY YARD, WASHINGTON, D.C.



Booklet of General Plans - Corrected to Suit Ship 1917 (116-15-20)

APPENDIX C

LOG OF OPERATIONS OF 2017 USS *SAN DIEGO* SURVEY

DATE	TIME	COMMENT
10 SEP		
	0900	Naval History and Heritage Command (NHHC) team departed Washington Navy Yard.
	1545	Arrived at the project hotel in Commack, NY.
	1645	Met R/V <i>Joanne Daiber</i> and University of Delaware (UD) team upon arrival at the United States Coast Guard (USCG) Station Fire Island.
	1830	NHHC team departed USCG Station Fire Island to procure supplies.
	1945	Operations ceased for NHHC, Naval Surface Warfare Center Carderock Division and Office of Naval Intelligence (USN) team.
11 SEP		
	0745	USN and UD team representatives meeting with USCG Station Fire Island Chief
	0830	During preparations, issue emerged with Edgetech 6205 sonar. Instrument must be removed from vessel and driven to Edgetech service center in order to procure a replacement.
	0900	Edgetech 6205 removed and dispatched. New unit expected on the evening of 11 SEP. Priority shifted to Autonomous Underwater Vehicle (AUV) operations for the day, as opposed to hull-mounted sonar survey.
	0920	<i>Joanne Daiber</i> departed USCG Station Fire Island.
	0930	Fuel filter issue with vessel detected prior to leaving the harbor.
	0950	Fuel filter issue addressed and departed USCG Station Fire Island.
	1110	Arrived on site of USS <i>San Diego</i> . Piloted over submerged site with depth echosounder to verify location. Depth in general vicinity registered at 103 FT.
	1120	Conductivity temperature and depth sensor (CTD) cast to obtain speed of sound in water reading.
	1130	AUV mission 1 launched (15 m depth – 900 kHz – 20 m lane spacing) to obtain general depth readings, basing orientation on MDSU 2017 survey data.
	1210	AUV surfaced mid-mission, possibly due to encountering a school of fish. Minimum altitude was 9 m. Side-scan data (SSS) recorded. Bathymetric data recorded. Photographs were deleted given visibility.
	1220	AUV mission 2 planned. Depth dropped to 20 m at 1800 kHz. Lane spacing condensed to 10 m.
	1230	AUV mission 2 launched.
	1310	AUV mission 2 completed as planned. SSS data and bathymetric data recorded. Few photographs captured any visible features.
	1335	AUV mission 3 planned alongside wreck on port side at 900 kHz at 10 m lane spacing.
	1340	AUV mission 3 launched.
	1400	AUV mission 3 completed as planned. Path appeared too far from side of hull. Planning AUV mission 4 by moving lanes closer to vessel, remaining at 900 kHz.
	1410	AUV mission 4 launched.

DATE	TIME	COMMENT
	1425	AUV surfaced. Data review revealed good coverage of the port side of the hull. Planned AUV mission 5 to run the same lanes as mission 4 at 1800 kHz.
	1430	AUV mission 5 launched.
	1445	AUV mission 5 completed. The frequency reduced the swath and the vehicle was unable to capture substantive data – the hull was barely visible in the recovered SSS data set. Planned AUV mission 6 by adjusting lanes to 20 m spacing, at 1800 kHz, and limiting altitude to 5m.
	1500	AUV mission 6 launched.
	1515	AUV mission 6 completed. Captured port side of hull fairly well. Planned AUV mission 7 along starboard side of the hull at 900 kHz.
	1525	AUV mission 7 launched.
	1535	AUV mission 7 completed. Data appeared to cover starboard side effectively. Planned AUV mission 8; intend to return to port side but attempt to get closer to the hull, while maintaining the 1800 kHz frequency.
	1545	AUV mission 8 launched.
	1555	AUV mission 8 completed, providing good data coverage of the port side of the hull.
	1605	AUV recovered successfully.
	1610	Intend to assess the visibility in the vicinity of the wreck through the use of a drop camera in preparation for upcoming ROV operations.
	1630	Drop camera visibility on site was in the 2 m range. Drop camera was recovered.
	1635	<i>Joanne Daiber</i> departed site for USCG Station Fire Island.
	1800	Arrived at USCG Station Fire Island and assisted with demobilization tasks. Reviewed photographs and captions to be released.
	1900	Departed USCG Station Fire Island for project hotel.
12 SEP		
	0800	Reviewed United States Naval Academy (USNA) blog.
	0830	Meeting with USCG Station Fire Island chief.
	0930	<i>Joanne Daiber</i> departing USCG Station Fire Island.
	1100	Arrived on site of <i>San Diego</i> and set up for ROV operations. Cast CTD and fixed position. Anchored in position east of wreck to explore aft port quarter of vessel.
	1145	Incapacitated fishing boat adjacent to site required assistance. Placed anchor line on moor to provide temporary assistance.
	1205	Provided assistance and assessed incapacitated vessel. Returned to moor over site of <i>San Diego</i> .
	1210	Repositioned <i>Joanne Daiber</i> . Planned to approach the wreck from the stern and then investigate port quarter from the seafloor to bilge keel, moving parallel to site towards midships. GoPro mounted on ROV to procure still photographs.
	1230	ROV launched. Captured by drone footage.
	1310	ROV feed intermittent. ROV sonar still operational. Decision made to pilot without visual feed and capture ROV sonar data, in addition to GoPro visual data.
	1320	ROV moved along stern quarter towards midships.
	1330	ROV prepared for recovery; determination made that GoPro camera will have expended its battery and piloting without a live video feed reached the point of diminishing returns and increasing risk.
	1340	ROV on deck of <i>Joanne Daiber</i> . Concluded ROV operations for the day, and factoring in the longer-than-usual planned transit, decided to dedicate afternoon to reintegrating and recalibrating the new Edgetech 6205 unit expected to arrive by mid-afternoon. Broke down equipment and prepared to tow incapacitated vessel to shore.

USS SAN DIEGO 2017 SURVEY

DATE	TIME	COMMENT
	1345	<i>Joanne Daiber</i> pulled anchor.
	1400	Initiated tow of incapacitated vessel, travelling at 6–5 kn, leading to a transit time of about 3 hours, instead of the usual 1.5 hours.
	1425	Tug from “Sea Tow” arrived to provide assistance to incapacitated vessel; transferred tow over to service vessel.
	1545	Arrived at USCG Station Fire Island. UD Edgetech 6205 unit was repaired and delivered, in addition to a second unit provided by Edgetech. Afternoon will be dedicated to reintegrating Edgetech 6205 onto <i>Joanne Daiber</i> and repairing ROV.
	1615	Decided to disregard faulty ROV camera in favor of mounting drop camera onto the ROV. Troubleshooting. NHHC conducted media interview.
	1745	USN team departed USCG Fire Island Station; UD team continued troubleshooting.
	1900	Reviewed photographs, drafted and submitted daily report.
13 SEP		
	0800	Reviewed USNA blog. NHHC team delayed departure to upload selected video and photograph files to Department of Defense media hub DVIDS.
	0830	NHHC team arrived at USCG Station Fire Island. Edgetech 6205 issue was resolved. Drop camera was mounted onto the ROV. Prepared to get underway with ROV, AUV, and hull-mounted sonar operational.
	0950	Departed USCG Station Fire Island.
	1005	Planned to conduct Edgetech 6205 survey passes first, then ROV operations.
	1105	Arrived on site of <i>San Diego</i> . Prepared to conduct hull-mounted sonar operations.
	1120	Collected data over site and initiated calibration process. Set up 6 lanes, 20 m apart, running parallel to the orientation of the wrecksite.
	1145	Initiated survey. Lane 1 (N to S) (course c. 163 degrees).
	1155	Lane 1 completed. Initiated Lane 2 (S to N).
	1200	Lane 2 completed. Initiated Lane 3 (N to S).
	1205	Lane 3 completed. Obtained CTD reading. Initiated Lane 4 (S to N).
	1210	Lane 4 completed. Initiated Lane 5 (N to S).
	1210	Lane 5 completed. Initiated Lane 6 (S to N).
	1215	Lane 6 completed. Completed N-S mapping lanes. Planning E-W lanes.
	1215	Initiated Lane 7 (NE to SW).
	1220	Lane 7 completed. Initiated Lane 8 (SW to NE). Lane not entirely accurate due to turning of vessel.
	1225	Lane 8 completed. Initiated Lane 9 (NE to SW).
	1225	Lane 9 completed. Initiated Lane 10 (SW to NE).
	1230	Lane 10 completed. Initiated Lane 11 (E to W).
	1230	Lane 11 completed. Initiated Lane 12 (N to S) along western extremity of hull.
	1250	Lane 12 completed and concluded hull-mounted survey. Set anchor in preparation for ROV operations.
	1320	Launched ROV.
	1325	ROV arrived on site of <i>San Diego</i> near stern. Less than 1 m of visibility.
	1340	ROV headed towards area of observed damage near midships.
	1345	ROV surfaced, repositioned <i>Joanne Daiber</i> ’s anchor to accommodate currents and desired survey location.

NAVAL HISTORY & HERITAGE COMMAND

DATE	TIME	COMMENT
	1405	<i>Joanne Daiber</i> anchored nearer to midships area. Due to limited visibility, altered plan to one short ROV investigation and then additional AUV operations.
	1425	Launched ROV with the aim of observing damage near midships area. Visibility limited; focused efforts on collecting sonar data in the vicinity of the damage.
	1450	Recovered ROV.
	1500	ROV on deck of <i>Joanne Daiber</i> . Prepared for AUV operations. Set up two AUV missions, one with lanes parallel to orientation of USS <i>San Diego</i> , the second with lanes perpendicular to the orientation of the vessel.
	1525	AUV mission 9 launched , collecting data at a depth of 20 m along circa 13 perpendicular lanes across the hull of the vessel at periodic intervals.
	1530	CTD cast collected sound velocity data.
	1545	Collected Edgetech 6205 data on the outskirts of the site, while AUV operations are ongoing. Lane 13 collected data to the south of <i>San Diego</i> , heading SW to NE. Lane 14 collected data to the north of <i>San Diego</i> , heading NE to SW.
	1615	Collected data for final Lane 15 , to the south of <i>San Diego</i> .
	1615	AUV surfaced. Wreck appears to have 8.5 m to 9 m of relief based on cursory review of data.
	1620	Conducted AUV mission 10. Collected data along four lanes parallel to <i>San Diego</i> at 8 m altitude, two on each side of the hull.
	1640	AUV surfaced. Initiated recovery operations.
	1650	AUV on deck of <i>Joanne Daiber</i> .
	1710	Completed final Edgetech 6205 passes for navigation calibration purposes.
	1715	CTD cast collected sound velocity data.
	1725	<i>Joanne Daiber</i> departed for USCG Station Fire Island.
	1845	<i>Joanne Daiber</i> arrived at USCG Station Fire Island [estimated time].
	1930	USN team departed USCG Station Fire Island for project hotel.
14 SEP		
	0745	Reviewed USNA blog.
	0830	Arrived at USCG Station Fire Island.
	0900	<i>Joanne Daiber</i> departed with 6 USCG personnel for vessel and equipment tour, along with mapping of inlet adjacent to USCG Station Fire Island.
	1015	Fishing vessel <i>Cap Tree Princess</i> hailed captain of <i>Joanne Daiber</i> . Reported that friend's father was involved in 1973 propeller recovery. Stated that they went back to salvage sunken barge, explaining why only evidence of the derrick has been observed.
	1100	USCG tour completed successfully.
	1130	MC1 Lockwood taken to project hotel to work on data organization. NHHC team procured supplies, while UD team initiated organization of data and demobilization of equipment.
	1300	NHHC assisted with demobilization of equipment.
	1530	Demobilization completed.
	1700-1900	Held project team debrief meeting and exchanged collected data.
15 SEP		
	0830	USN team prepared for departure from project hotel.
	0930	NHHC team departed project hotel in Commack, NY.
	1630	NHHC team arrived at Washington Navy Yard.

APPENDIX D
MEDIA CLIPS ASSOCIATED WITH THE 2017 USS SAN DIEGO SURVEY
PREPARED BY COMMUNICATION BRANCH, NHHC (09/26/2017)

1. Navy Announces Plan to Survey Wreck of WWI Cruiser San Diego
Naval History and Heritage Command, 6 September 2017
2. UD Students Research Sunken WWI Ship
By Katie Peikes & Megan Pauly, WDDE 91.1 (Dover) WMPH 91.7 (Wilmington) 6 September 2017
3. Navy Announces Plan to Survey Wreck of WWI Cruiser San Diego
AeroTech News, 8 September 2017
4. Navy, UD Partner to Investigate WWI Shipwreck
WDEL, 101.7 FM, 1150 AM (Wilmington, DE), 9 September 2017
5. 99 Years Later, Navy Probing Warship Disaster Off Long Island
By Sam Roberts, New York Times, 10 September 2017
6. Navy Investigating 99-Year-Old Warship Wreck
By Kyle Mizokami, Popular Mechanics, 11 September 2017
7. Surveying Sunken WWI Ship USS San Diego
By Midshipman Nolan T. Brandon, U.S. Naval Academy, The Sextant, 11–14 September 2017
8. Navy Announces Plan to Survey Underwater Wreck of WWI Cruiser USS San Diego
U.S. World War I Centennial Commission, 13 September 2017
9. Navy to Study Wreckage of WWI Ship that Sank Near LI
By Ilana Siyance, The Jewish Voice, 13 September 2017
10. Navy Surveys WWI Shipwreck off Long Island
By Kristin Thorne and Eyewitness News, WABC TV-7 (ABC, New York), 14 September 2017
11. Navy Surveys WWI Shipwreck off Long Island
Voice Over Video Reader, WABC TV-7 (ABC, New York), 14 September 2017
12. What Sank the USS San Diego? A WWI Naval Mystery May Be Solved
By Jeanette Steele, San Diego Union Tribune, 15 September 2017
13. Video: A WWI Naval Mystery May Be Solved
By Jeanette Steele, San Diego Union Tribune, 15 September 2017
14. US Navy Surveys Wreck of WWI Cruiser Sunk in 1918
Centenary News, First World War 1914-1918, 17 September 2017

15. Alexis Catsambis: Historians Hope to Crack Century-old Naval Mystery

Interview by Tom Temin, Federal News Radio, 18 September 2017

16. UD Team Joins Navy Historical Mission at WWI Cruiser Wreck Site

Mark Fouser, WDEL, 101.7 FM, 1150 AM (Wilmington, DE), 18 September 2017

17. Uncovering New Clues About A 99-Year-Old Underwater War Grave

By Beth Young, East End Beacon Long Island, 23 September 2017