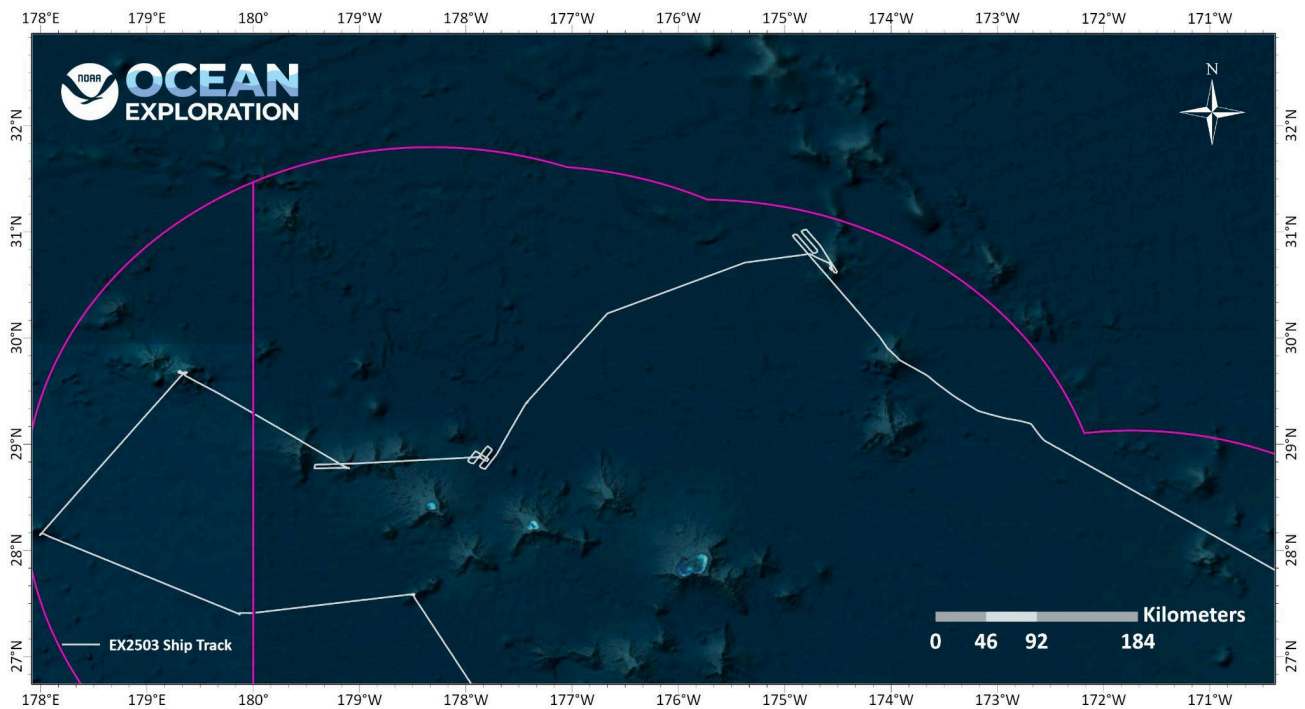


# ROV Dive Summary

## EX2503, Dive 06, April 19, 2025

### General Location Map



### Dive Information

Site Name	USS Yorktown Dive #1
General Area Descriptor	Papahānaumokuākea
Science Team Leads	Sara Kahanamoku-Meyer (UH Mānoa/HI Sea Grant) and Brian Kennedy (ODL/BU)
Expedition Coordinator	Sam Cuellar (NOAA Ocean Exploration)
ROV Dive Supervisor	Chris Ritter (GFOE)
Mapping Lead	Neah Baechler (NOAA Ocean Exploration/UCAR)
Sample Data Manager	Anna Lienesch and Jordan Schweizer (NCEI)

Dive Purpose	To explore specific science questions on several areas of the USS Yorktown
Maritime Heritage Restrictions	Yes
ROV Dive Summary Data	<p>Dive Type: Normal</p> <p>In Water: 2025-04-19T18:25:50.402746 POSITION RESTRICTED</p> <p>On Bottom: 2025-04-19T21:28:02.831709 POSITION RESTRICTED</p> <p>Off Bottom: 2025-04-20T01:38:46.834523 POSITION RESTRICTED</p> <p>Out Water: 2025-04-20T04:35:44.177828 POSITION RESTRICTED</p> <p>Dive Duration: 10:09:53</p> <p>Bottom Time: 4:10:44</p> <p>Max Vehicle Depth: RESTRICTED</p> <p>Min Seafloor Depth: RESTRICTED</p> <p>Distance Travelled: 441.0 m</p>

## Dive Description

*Deep Discoverer (D2)* made contact with the bottom ~80m off the port side of the ship near midships, observing a large amount of 'ejecta' and clumped sediment that had likely been forcefully ejected from the seafloor as *Yorktown* and its associated pressure wave impacted the bottom. Ridges of compressed sediment were observed surrounding the hull as first visual contact was made approximately midships on the port side in the vicinity of the port side torpedo impact suffered during the Battle of Midway. Sediment surrounding the hull was compressed and cleaved, and showed obvious signs of movement from the sinking event.

Initial inspection of *Yorktown* began just forward of the forward-most port side torpedo impact point on the hull suffered at the Battle of Midway, in the vicinity of frames 75-80. Obvious battle damage, warping, and buckling of the hull structure were observed below the waterline, with a gaping hole revealing internal structures of *Yorktown*. Steel plates from the hull were twisted and dislodged, resting on the seabed near the impact point. Above, historically reported damage to the upper catwalk structure just below the flight deck was also observed.

Moving vertically from this point, D2 moved up to the hangar deck, moving to peer inside the port side hangar roller door at approximately frame 84. Peering inside with the main zoom camera and with what light could be shone inside, views of the far side and upper structure of the hangar deck were captured. From this location, D2 proceeded aft to the larger rolling door at approximately frame 90. Inside, a likely Douglas SBD3 Dauntless aircraft wing with ball and star insignia was observed leaning against the far wall across from the hangar door, along with other debris scattered across the hangar deck floor.

D2 then proceeded up and forward to the Gallery Deck, just above the hangar deck doors, peering into an open doorway that leads into the Flag Office space aft of the Captain's and Admiral's cabins. The ROV continued moving forward, observing twisted and damaged catwalks of the Gallery Deck before imaging the open hatchways of the Captain's and Admiral's cabins. From here, D2 proceeded up to the level of the flight deck, gaining altitude above its surface between frames 80 and 85. White bacterial growth was observed on mounds covering what appeared to be the flight deck barrier cables for aircraft recovery operations laid athwartships across the flight deck of *Yorktown*.

Upon closer inspection of the flight deck, the Douglas fir wooden surface seemed to be mostly intact, covered with a layer of marine snow and sediments.

On transit across the flight deck towards the port side of the *Yorktown's* island, a species of *Rhopalonematidae* was observed.

Heavy deterioration was observed on the port side of the ship's stacks, where fires raged following a bomb strike from Japanese dive bombers during the Battle of Midway. Many of the walkways and structures appeared to be intact, but paint and steel deterioration were markedly more severe than seen further forward on the island, where little to no fire damage occurred.

D2 moved forward along the port side of the island, passing the windows and skylights of the Pilot House and Navigating Bridge. Damage to the island and bridge superstructure can be seen. A large cable (possibly a tow cable) is draped across the Navigating Bridge, and one of the 50 cal gun emplacements and MK33 gun directors was imaged.

A slight move by the ROV aft imaged the forward structure of the stack area, displaying heavy damage and additional corrosion likely caused by the stack fires during the course of the battle.

D2 continued to move towards the bow to the forward-most part of the navigation bridge, imaging *Yorktown's* ship bell, which still hung in place forward of the windows. From this forwardmost point, the ROV began its transit again aft, passing the heavily deteriorated stacks, capturing imagery of the ship's horn as well as the top of the stacks and interior damage to the funnel tubes and exterior stack steel. Damage and warping can be seen most on the aft end of the stacks, with the steel structure around the #3 stack completely ripped away and exposing the stack tube. This area also revealed a gun director pedestal with cables emerging, but the director itself was missing.

Following the examination of the aft area of the island, D2 turned and traveled aft, imaging a large gap in the flight deck expansion joints, likely around 20cm in width, with the internal structure of the hull visible. Turning, the aft crane was imaged, as well as a quad 1.1" gun, near where a bomb impact on the flight deck injured numerous sailors during the battle.

As D2 entered the midships #2 aircraft elevator, a likely undescribed *Atolla* jellyfish was observed. Upon entering the elevator, the starboard side list of *Yorktown* on the bottom was apparent.

First views of the elevator show a portion of the bottom of the elevator missing, approximately half. Turning towards the starboard side, the first glimpses of *Yorktown*'s large mural are revealed, displaying a full world map, a compass rose flanked by two seahorses, and a propeller, star, and dot insignia repeated border. The mural is in remarkably good preservation condition, with the continents showing blue and retaining great detail, including many Pacific islands, with their land borders outlined in a red-ish pigmented paint. These paints are likely a different color due to degradation over time. The mural stretches from wall to wall on the starboard side of the elevator.

Looking forward from the elevator, an aircraft wing was observed on its side on the hangar deck, with a likely star and dot insignia on the wing barely visible. Other debris and sediment layer the floor of the hangar deck.

Looking back at the mural, rusticles descend from the top down sections of the mural. In the lower right corner of the map, a legend titled 'A Chart of the Cruises of the USS *Yorktown*' can be seen. Zooming into the map, 'negative' lines can be seen where paint used to exist, likely reflecting transit lines of USS *Yorktown* in her voyages across the Atlantic and Caribbean. Faint traces of paint on the lines remain in areas closer to the Chesapeake Bay and farther north on the map. Other lines carry over towards Europe and the United Kingdom.

On the far right side of the mural (towards the aft end of *Yorktown*), a depiction of the front half of *Yorktown*, from bow to midships, can be seen on the ocean surface, with a search light to the sky, the painted 'Y' clearly visible on the side of the stacks and island in the image of the ship.

The ROV camera, looking aft from the elevator space down the hangar deck, revealed a clump of wires and cables protruding from the base of the elevator and laid aft, out of the missing part of the bottom of the elevator platform. Peering into the aft end of the hangar deck, the heavy overhead I-beam used to move aircraft and other heavy materials along the hangar deck can be clearly seen. Looking to port, a close in of the far wall shows paint bubbling with corrosion products, which have developed underneath. A chain can be seen attached to the elevator platform and somewhere above towards the flight deck.

Returning to looking forward again, a strange object is observed, with a round end on one side and a flat, planar surface on the other. At first glance, it appears to be an aircraft component, perhaps a tail flap or similar flight surface, but it is difficult to tell with the current imagery. It is near the wing observed earlier, looking forward. Another object appears to be propped up against the starboard wall of the hangar deck; it is hard to discern what it may be.

The ROV, after completing the rotational view of the hangar deck, exits the elevator facing forward, with the starboard tilt of Yorktown apparent from a level ROV compared to a listing flight deck. From here, the ROV proceeds aft across the flight deck towards Yorktown's port quarter, with remains of the wooden flight deck, white biological mats covering the remains of wires from the arresting gear, and the remains of the arresting gear stanchions all visible.

Emerging over the port edge of the flight deck, D2 descends around approximately frame 125, just forward of the port quarter 20mm gun gallery. Proceeding along the gun deck, D2 imaged a probable firefighting pump and several bronze placards. Descending below the gun deck, back to the level of the hangar deck, imaging inside openings and door badges, including 'Hangar Space 01-126'. D2 proceeds from here back up to the 20mm gun galleries. The gun shields on both the guns and gun tubs remain in place, and the area shows remarkable preservation. An identification badge of one of the 20mm gun cradles is zoomed in on and inspected in detail.

Following further inspection of the gun galleries, D2 drops back to the hangar deck, inspecting the port aft boat davit, located at approximately frame 153, and images Hangar Space 1-153-2. A rolled firehose attached to the bulkhead appears to be covered in some type of bacterial mat. Adjacent to this, a placard describing the use and operation of foam fire extinguishers and equipment was inspected in detail.

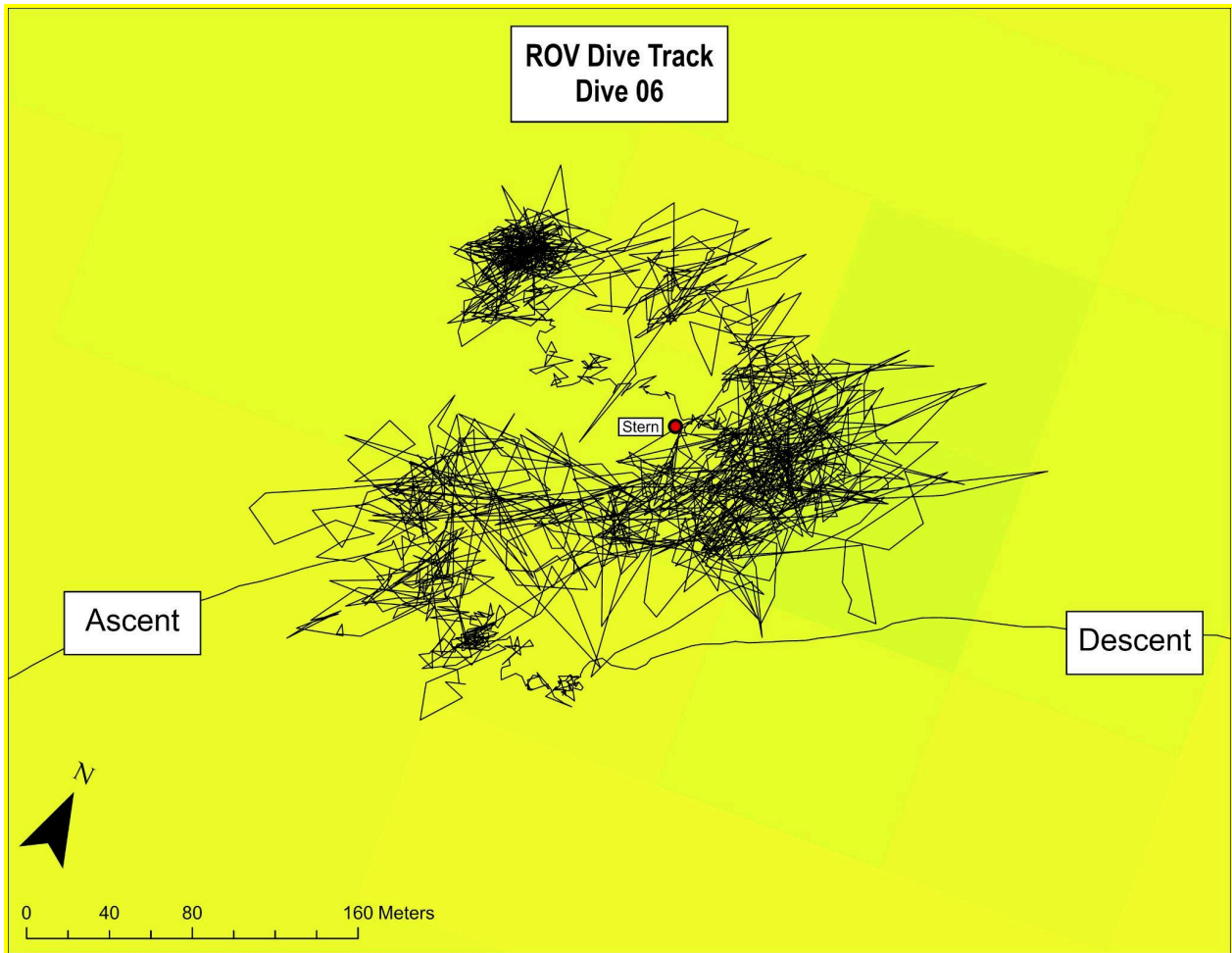
	<p>In this same area, a still-mounted .50 caliber machine gun is observed. This is likely the same location where a sailor, presumed dead or missed during the initial evacuation of the ship, crawled from sick bay and fired the weapon, alerting nearby ships to send a boat over and rescue them.</p> <p>Moving further aft, a flight deck expansion joint is seen from below. D2 settles into the hangar deck opening between frames 158 and 172, with multiple overhead lights from the hangar deck visible on the deck where they have fallen due to the sinking event or degradation over time on the seafloor.</p> <p>Far back, near the starboard side of the hangar deck, the faint outline of a car and its chrome hubcaps and trim became visible from the port garage opening on the hangar deck. Based on its shape and outline, it is suspected of being a 1940s Ford Super Deluxe 'Woodie'. Upon exiting the hangar space, a quick look at the 5" guns was taken, where the forward edge of the guntub shields had been removed for both aft port guns, likely in preparation for dumping overboard during salvage to correct the starboard list, similar to the forward port guns, which were jettisoned.</p> <p>D2 begins ascent to the surface.</p>
Notable Observations	
Community and Habitat Observations	<p>Corals and Sponges — Present</p> <p>Chemosynthetic Community — Present</p> <p>High biodiversity Community — Absent</p> <p>Active Seep or Vent — Absent</p> <p>Extinct Seep or Vent — Absent</p> <p>Hydrates — Absent</p>
CMECS Feature Type(s)	Wreck
SeaTube Link (science annotations)	<a href="https://data.oceannetworks.ca/app/dive-logs/1405">https://data.oceannetworks.ca/app/dive-logs/1405</a>

## Equipment Deployed

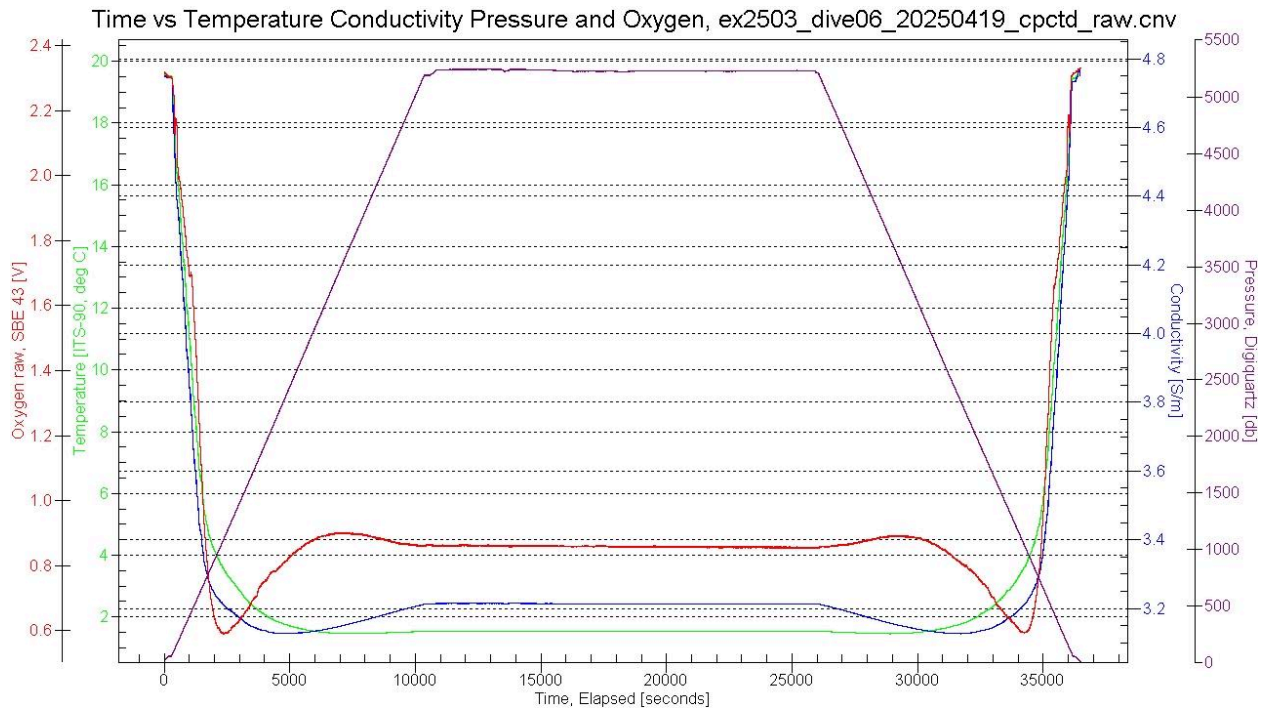
ROV	<i>Deep Discoverer</i>
Camera Platform	<i>Seirios</i>

ROV Measurements	The following ROV measurements, data streams and equipment are used on each ROV deployment: CTD, depth, scanning sonar, USBL position, altitude, heading, attitude, high-resolution cameras, low resolution cameras, manipulator arms, suction sampler, sample drawers and thrusters. The following row notes if any of these sensors were malfunctioning or not operational.
Equipment Malfunctions	None

## Close-Up Map of Main Dive Site



## Sound Speed Manager Image of ROV CTD Profile



Ambient conditions during Dive 06. Plot shows Temperature (C°), Conductivity (S/m), Pressure (db), and Oxygen (V; as measured by SBE43).

## Representative Photos of the Dive



A plane wing is seen propped up against the starboard wall of the hangar deck on *USS Yorktown*.



A presumed tow cable from *Yorktown's* salvage efforts drape across the bridge, just in front of a mounted .50 caliber gun position.



*Yorktown's* bell can be seen hanging on the forward edge of the ship's bridge.



An expansion joint can be seen in the flight deck of *Yorktown*.



A quad 1.1-inch anti-aircraft gun is seen still pointing skyward, just aft of *Yorktown's* island. This gun was the site of a near-bomb hit, resulting in casualties during the Battle of Midway. The torn away gun tub shield on the far side of the image is likely due to the starboard torpedo strikes from the Japanese sub *I-168*.



A potentially undescribed species of jellyfish seen on *Yorktown* above the flight deck.





Images of the mural found on *Yorktown* in the midships #2 elevator on the interior starboard bulkhead of the ship.



Condition of the wooden flight deck on board *Yorktown*.



A view of the arresting wire stanchions on the flight deck.



A 20mm Oerlikon mounted on the port aft gun gallery.



A view of machinery on the lower port aft quarter, showing a firefighting hose roll covered in an unidentified bacterial mat.



This particular .50-caliber machine gun was used by Seaman Second Class Norman Pichette and Seaman George Weise to signal destroyer USS *Hughes* (DD-410) which was picking up *Yorktown* survivors. Pichette and Weise had been left in the sick bay due to the severity of their wounds when the abandon ship call was made. Weise survived the war, but Pichette was soon after buried at sea near *Yorktown*. For more information: <https://www.usni.org/magazines/proceedings/2014/july/lest-we-forget-weise-and-pichette>.



A 5-inch gun in the port aft gun gallery. The guntub shield has been removed, likely in preparation for jettisoning the gun during salvage efforts to correct *Yorktown's* list to starboard before being torpedoed by I-168.

## Scientists Involved

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