VACAPES Offshore Cetacean Study, Virginia Beach, Virginia

2024/25

Annual Progress Report

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Cover Photo Credits:

Drone image of sperm whales (*Physeter macrocephalus*) HDRVAPm156 and HDRVAPm155 with digital acoustic recording and Customized Animal Tracking Solutions tags off the coast of Virginia. Photograph taken under National Marine Fisheries Service Scientific Research Permit No. 28184.

Acknowledgments:

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Science ⚓ Stewardship ⚓ Protection

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Acronyms and Abbreviations

°N	degrees North
°W	degrees West
BSS	Beaufort sea state
CATS	Customized Animal Tracking Solutions
cm	centimeter(s)
COMPASS	Cetacean Observation and Marine Protected Animal Survey Software
DTAG	digital acoustic recording tag
ESA	Endangered Species Act
GMT	Greenwich Mean Time
GPS	Global Positioning System
hr	hour(s)
ID	Identification Number
kHz	kilohertz
km	kilometer(s)
LiDAR	Light Detection and Ranging
LIMPET	Low-Impact Minimally Percutaneous Electronic Transmitter
m	meter(s)
Max	maximum
min	minute(s)
MMO	marine mammal observer
N/A	not applicable
nm	nautical mile(s)
No.	number
OCS	Offshore Cetacean Study
OPAREA	Operating Area
photo-ID	photo-identification
SPOT	Smart Position and Temperature
U.S.	United States
VACAPES	Virginia Capes
VHF	very high frequency

1. Introduction and Background

The United States (U.S.) Navy routinely conducts training and testing activities within the Virginia Capes (VACAPES) Operating Area (OPAREA) off the Mid-Atlantic and Southeast U.S. The deeper waters of this region—including the outer continental shelf, shelf break, and continental slope—constitute important habitat for numerous cetacean species. Early surveys conducted by the Cetacean and Turtle Assessment Program identified the shelf edge from Cape Hatteras to Georges Bank as one of the most intensively used cetacean habitats in the northeastern U.S. (CETAP 1982; Kenney and Winn 1986). Subsequent and ongoing, broad-scale surveys by the National Marine Fisheries Service, including the Atlantic Marine Assessment Program for Protected Species, as well as recent marine mammal stock-assessment reports (Hayes et al. 2024) continue to demonstrate similar spatial patterns of cetacean occurrence.

Cetacean species commonly observed seasonally in outer continental shelf, slope, and rise waters include both mysticetes and odontocetes, such as fin whales (*Balaenoptera physalus*), sei whales (*Balaenoptera borealis*), minke whales (*Balaenoptera acutorostrata*), humpback whales (*Megaptera novaeangliae*), sperm whales (*Physeter macrocephalus*), beaked whales (*Ziphius cavirostris*, *Mesoplodo*n spp.), long- and short-finned pilot whales (*Globicephala melas* and *G. macrorhynchus*, respectively), Risso's dolphins (*Grampus griseus*), common bottlenose dolphins (*Tursiops truncatus*), common dolphins (*Delphinus delphis*), Atlantic white-sided dolphins (*Lagenorhynchus acutus*), Atlantic spotted dolphins (*Stenella frontalis*), and striped dolphins (*Stenella coeruleoalba*) (CETAP 1982; Hain et al. 1985, 1992; Kenney and Winn 1986, 1987; Selzer and Payne 1988; Kenney 1990; Payne and Heinemann 1993; Waring et al. 1993, 2001; Northridge et al. 1997; Palka et al. 1997; Mead 2009; NEFSC and SEFSC 2012, 2013; Jefferson et al. 2014; Hayes et al. 2024). Fin, sei, and sperm whales are all listed as endangered under the U.S. Endangered Species Act (ESA).

Aerial and vessel surveys, together with passive acoustic monitoring conducted under the U.S. Navy Marine Species Monitoring Program (Mallette et al. 2017, 2018; Salisbury et al. 2018; Foley et al. 2019; Cotter 2019), have provided valuable information on cetacean distribution within the region. These data support that the outer shelf and slope waters off Virginia within the VACAPES OPAREA are well-suited for continued studies of cetacean ecology and behavior. Offshore surveys were initially conducted as part of the Mid-Atlantic Humpback Whale Monitoring project from April 2015 through June 2016 (Aschettino et al. 2016). Building on this effort, a dedicated study of outer continental shelf cetaceans began in July 2016 (Engelhaupt et al. 2017).

Priority species were encountered beyond the continental slope, expanding survey coverage farther offshore. As such, the project was renamed the Offshore Cetacean Study (OCS; Engelhaupt et al. 2024). This progress report summarizes offshore monitoring activities conducted between September 2024 and August 2025. The overarching objectives of the OCS remain focused on addressing key information gaps related to cetacean occurrence, exposure, and response within the conceptual framework for the U.S Navy Marine Species Monitoring Program.

To address these gaps in offshore waters within the VACAPES OPAREA, the OCS project employs an integrated suite of methods: (1) vessel- and drone-based photo-identification (photo-ID), photogrammetry, and behavioral observations to assess movement patterns, site fidelity, habitat use, life history, and behavior; (2) biopsy sampling to support genetic analyses of individual identity, sex, and stock structure; (3) satellite-linked telemetry tagging to characterize residency patterns, diving behavior, and habitat use over intermediate time scales (weeks to months); and (4) short-duration, suction-cup tagging to collect high-resolution movement and acoustic data related to diving and foraging behavior over hours to days.

Residency and movement patterns are of particular interest due to the potential for repeated exposure to U.S. Navy training and testing activities within the VACAPES OPAREA. Previous research near the continental shelf break off southeastern Virginia and Cape Hatteras, North Carolina, suggest year-round presence of several species of cetaceans, including beaked and short-finned pilot whales (McAlarney et al. 2018a, 2018b; Waples and Read 2025). Tagging conducted as part of the OCS enables assessment of movement patterns across a broad suite of species as well as provides insight into spatial and temporal overlap among individuals, species, and Navy training exercises. Given tag attachment durations and results from previous tagging studies off Cape Hatteras (Baird et al. 2018), there is also potential to track movements beyond VACAPES, including into the Cherry Point OPAREA to the south and Atlantic City OPAREA to the north.

Consistent with the scientific objectives of the U.S. Navy's Strategic Planning Process (DoN 2013), the OCS aims to support the U.S. Navy and regulatory agencies with environmental planning and regulatory compliance by addressing the following questions:

- Which cetacean species occur within the VACAPES OPAREA off Virginia, and how does occurrence fluctuate seasonally?
- What are the baseline behaviors and ecological relationships of offshore cetaceans within the study area?
- Do individual cetaceans exhibit site fidelity within specific regions of the study area over weeks, months, or years?
- What is the seasonal extent of cetacean movements within and around U.S. Navy VACAPES training-range boxes?
- Do cetaceans spend significant time within or primarily move through areas of U.S. Navy live-fire or Anti-Submarine Warfare training events?

2. Methods

Surveys were conducted in offshore waters approximately 90 to 160 kilometers (km) or 50 to 85 nautical miles (nm) off the coast of Virginia (**Figure 1**). The study area encompasses the outer continental shelf, shelf break, slope waters, and Norfolk and Washington Canyons. Water depths ranged from approximately 50 to 2,500 meters (m).

2.1 Survey Operations

OCS surveys were primarily conducted aboard the 16.2-m charter sport-fishing vessel *Top Notch*, with similar vessels used when it was unavailable. All vessels were equipped with a Global Positioning System (GPS), marine radio, emergency beacon, life raft, depth sounder, and emergency equipment.

The scientific crew typically consisted of three to five marine mammal observers (MMOs), including at least one photographer/drone operator, one tagging specialist, and one biopsy specialist/data recorder. Roles were interchangeable. An aerial survey platform was occasionally integrated to assist with locating priority species (Ozog and Engelhaupt 2026).

Survey days were planned to maximize time on effort under favorable weather conditions, typically targeting Beaufort sea state (BSS) of 3 or lower and good visibility. Surveys required approximately 3 hours (hr) of transit each way at cruising speeds of 20 knots or more.

All surveys departed from Rudee Inlet in Virginia Beach, Virginia. Departures were scheduled to allow maximum possible daylight survey time, and a minimum of 12 hr were allocated per survey day. MMOs remained on-effort during outbound and inbound transit when daylight and BSS 4 or less permitted. Given transit distance, survey effort within the primary study area continued until the end of the day even if sea states deteriorated (up to BSS 6), unless conditions were deemed unsafe. Weather forecasts were closely monitored to minimize such conditions.

Daily survey coverage areas were chosen based on weather, clearance, and reports of priority species from recent aerial or vessel surveys. Areas of frequent U.S. Navy training use, such as Norfolk Canyon (**Figure 1**), were prioritized. Surveys did not follow formal line-transect protocols; instead, vessels followed flexible tracklines designed to maximize encounter rates. Search speeds averaged 18 to 22 km/hr (10 to 12 knots), often following zig-zag patterns across depth gradients.

MMOs used unaided eyes and 10x30 hand-held, image-stabilized binoculars to cover a 270-degree field forward and abeam of the vessel. In waters deeper than 400 m, a directional hydrophone was periodically deployed to detect sperm whale clicks. When detections occurred, efforts were made to localize and approach the source; otherwise listening stations were conducted every 20 to 30 minutes (min).

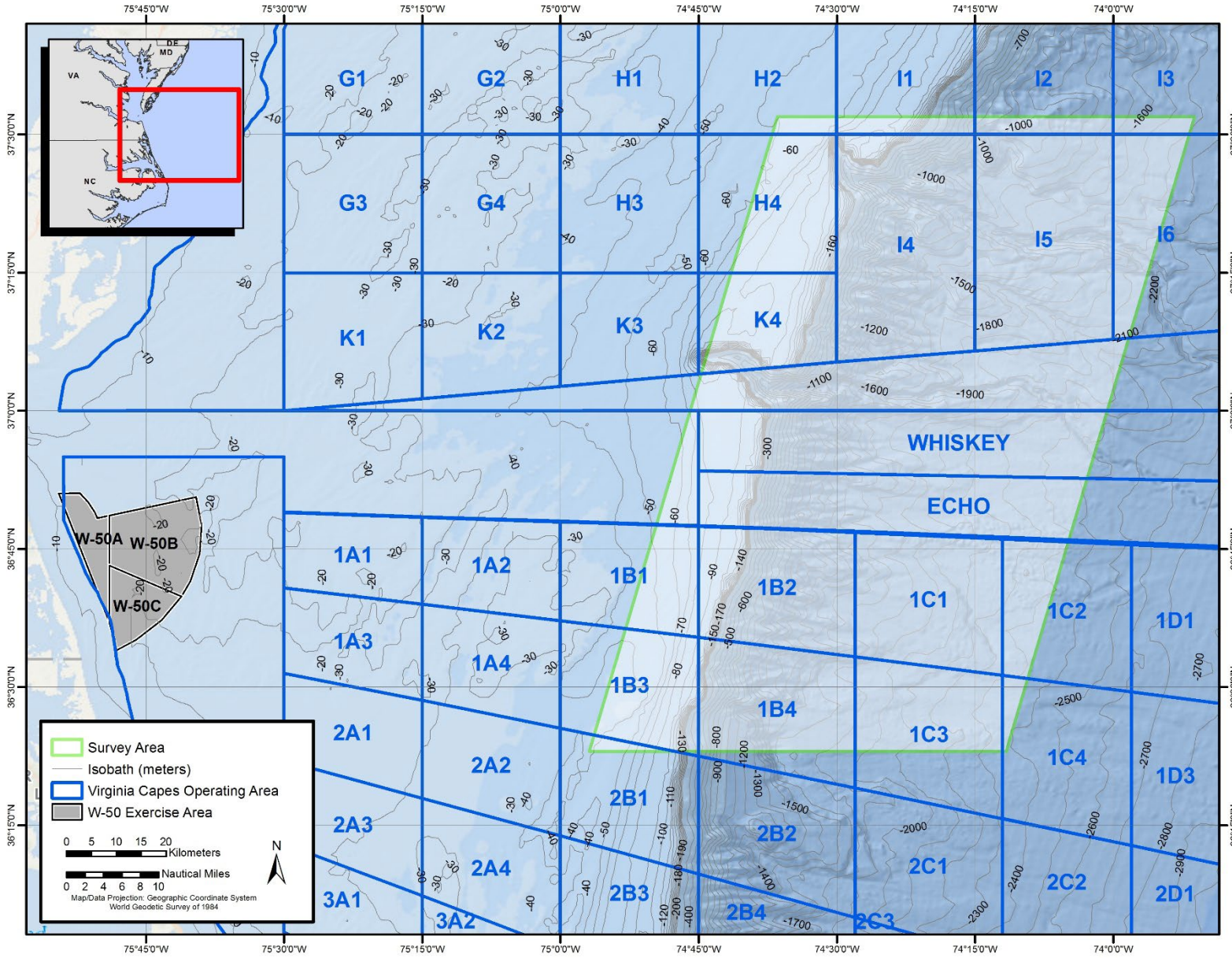

Figure 1. Map of the offshore study area off southeastern Virginia and northern North Carolina, and VACAPES training range surface grid within the region.

Upon sighting, one MMO recorded data using Cetacean Observation and Marine Protected Animal Survey Software (COMPASS; Richlen et al. 2019) on an iPad, while others tracked animals and collected photo-ID images. Depending on species and conditions, other efforts included drone operations, biopsy sampling, satellite tagging, and/or suction-cup tagging. Baleen, sperm, and beaked whales were highest priority. Rarely encountered species (e.g., killer whales [*Orcinus orca*], false killer whales [*Pseudorca crassidens*], melon-headed whales [*Peponocephala electra*], and pygmy killer whales [*Feresa attenuata*]) were also prioritized when encountered. Pilot whales and Risso's dolphins were generally medium priority, while other delphinids were low priority. Approaches to priority species were conducted to minimize disturbance to the animals while maximizing data collection. The Chief Scientist determined when to conclude efforts or switch to alternate sightings.

2.2 Photography, Photogrammetry, and Data Logging

Photo-ID images were collected using digital single-lens reflex (Canon 7D Mark II,1DX Mark II) or mirrorless (R5) cameras with 100- to 400-millimeter lenses. Emphasis was placed on obtaining high-quality images of flukes and/or dorsal fins. Baleen whale images were added to HDR Inc. (HDR) catalogs and summarized in the *Mid-Atlantic Nearshore and Mid-shelf Baleen Whale Monitoring Project* annual report (Aschettino et al. 2026). Images of deep-diving species were added to the HDR catalogs and shared with regional catalogs: North Atlantic and Mediterranean Sperm Whale Catalog curated by Whale Watch Azores, and Cape Hatteras Short-finned Pilot Whale and Goose-beaked Whale Catalogs maintained by Duke University (Waples et al. 2026).

Environmental conditions, observer effort, and sighting data were logged in COMPASS. Environmental data were updated as conditions changed. Sighting records included distance and bearing, species identification, group size, behavior, photographs, and videos when available. Distances were estimated visually. Vessel position and speed were recorded automatically via GPS at 30-second intervals.

Drone operations were incorporated beginning in 2019 using DJI Phantom 4 Pro V2.0 to collect morphometric and body condition data. Flights were conducted at 15- to 30-m altitude, and video was recorded at 4K resolution (30 frames per second). A custom LiDAR precision altimeter (Dawson et al. 2017) improved accuracy to ±5 centimeters (cm). Due to National Defense Authorization Act compliance requirements, HDR acquired a Freefly Astro drone to allow for higher resolution photogrammetry and archival suction-cup tag drops. While waiting for customization to be completed, no drone data were collected during the 2024/25 season.

2.3 Biopsy Sample Collection

Biopsy samples were collected from priority species following photo-ID efforts using a Barnett recurve crossbow equipped with biopsy darts (Barnett Outdoors, LLC, Tarpon Springs, Florida). Skin samples were stored in Whirl-Pak® bags on ice. Shoreside, samples were cross-sectioned, transferred to Cryovial® tubes, and frozen prior to shipment. Sperm whale genetic analyses were completed by Oregon State University; humpback, fin, and blue whale samples were included in those analyzed by the University of Groningen collected during *Mid-Atlantic Nearshore and Mid-shelf Baleen Whale Monitoring Project* surveys (Aschettino et al. 2026).

2.4 Satellite Tagging

Three Wildlife Computers (Redmond, Washington) tag types were deployed in Low-Impact Minimally Percutaneous Electronic Transmitter (LIMPET) configuration (Andrews et al. 2008): Smart Position and Temperature (SPOT)-365, SPLASH10-333, SPLASH10-F-333. Tags were deployed remotely using a DAN-INJECT J.M.SP.25 carbon dioxide projector (DAN-INJECT ApS, Børkop, Denmark).

LIMPET tags were attached using two 6.8-cm surgical-grade titanium darts with backward-facing petals, securing tags to the dorsal fin. Tags were programmed to maximize data transmission during expected attachment durations (less than 60 days). Based on satellite availability within the area, tags were programmed to transmit for 16 hr per day, with daily limits of 600 to 1,300 transmissions depending on tag type and species.

Dive definitions for analysis differed by species: a sperm whale dive was defined as depth greater than 50 m and duration greater than 5 min; for baleen whales the definition was depth greater than 2 m and duration greater than 2 min. Locations were estimated by the Argos system using the Kalman filtering location algorithm (Argos User's Manual© 2007–2015 Collective Location Services), supplemented with Fastloc® GPS for SPLASH10-F tags. Using Movebank, unrealistic locations (e.g., on land) were manually removed prior to a final, Douglas Argos filtering step. Dive and movement analyses were conducted in R (R Core Team 2018).

2.5 Digital Archival Tagging

Short-duration suction-cup tagging began in 2021 using digital acoustic recording tags (DTAGs; Johnson and Tyack 2003) and attaching them to priority species via hand-held carbon fiber poles. DTAGs (versions 3 and 4) were equipped with a hydrophone, pressure sensor, a three-axis accelerometer and magnetometer, and a GPS logger. The audio sampling rate was set to 240 kilohertz (kHz) for sperm whales. Tags were programmed for timed release and recovered using very high frequency (VHF) tracking equipment.

Customized Animal Tracking Solutions (CATS) tags were added to the OCS project in 2022/23 and deployed on sperm whales. CATS tags recorded movement, depth, audio (96 kHz), and video (HD or 4K), and included VHF transmitters and SPOT-6 satellite beacons to aid recovery. Release timing was controlled using corroding links.

Post-recovery calibration and data visualization were conducted using MATLAB R2023a and tools available through animaltags.org. Calibration procedures followed Cade et al. (2021).

3. Results

Seventeen offshore vessel surveys were conducted between September 2024 and August 2025, covering 5,283 km of trackline during 205.9 hr of effort (**Table 1; Figure 2**).

Surveys during the 2024 to 2025 period resulted in 176 marine mammal and 18 sea turtle sightings (**Figure 3** through **Figure 6**; **Appendices A** and **B**). Twelve cetacean taxa were identified: five baleen whale species, including fin whale (*n*=12), humpback whale (*n*=7), blue whale (*Balaenoptera musculus*; *n*=1), minke whale (*n*=1), and North Atlantic right whale (*Eubalaena glacialis*; *n*=1); and seven odontocete taxa, including unidentified pilot whale (*n*=39), sperm whale (*n*=17), goose-beaked whale (*n*=1), short-finned pilot whale (*n*=1), common bottlenose dolphin (*n*=32), common dolphin (n=31), Risso's dolphin (*n*=26), and Atlantic spotted dolphin (*n*=7). Because both short- and long-finned pilot whales may occur within this region, most sightings of the genus *Globicephala* spp. were not assigned a species unless they were closely approached and could be definitively identified, which was not typically the case. Two sea turtle species were also identified: loggerhead turtle (*Caretta caretta*; *n*=14) and leatherback turtle (*Dermochelys coriacea*; *n*=4). Sea turtle sightings were logged when species could be confirmed; unidentified turtles are not recorded.

Table 1. Summary of 2024/25 offshore survey effort and sightings within the VACAPES OCS study area.

Date	Survey Duration (min)	Distance Surveyed (km)	No. Sightings	No. Individuals	Baleen Whales No. Sightings/ No. Individuals	Deep Diving Whales[a] No. Sightings/ No. Individuals	Dolphins No. Sightings/ No. Individuals	Sea Turtles No. Sightings/ No. Individuals
10-Sep-2024	706	313	27	524	0/0	8/91	12/426	7/7
23-Feb-2025	710	204	5	15	3/7	1/1	1/7	0/0
24-Feb-2025	708	273	8	51	3/9	2/5	3/37	0/0
10-Mar-2025	719	319	10	161	1/6	1/7	8/149	0/0
25-Apr-2025	743	354	21	512	3/3	3/14	15/495	1/1
07-May-2025	840	348	12	129	0/0	2/6	7/119	3/4
08-May-2025	806	382	16	335	0/0	4/24	11/310	1/1
09-May-2025	442	301	0	0	0/0	0/0	0/0	0/0
11-May-2025	770	261	9	96	1/2	1/5	5/87	2/2
25-May-2025	768	281	12	171	4/4	3/127	3/36	2/4
03-Jun-2025	765	312	13	370	0/0	4/143	9/227	0/0
04-Jun-2025	730	396	13	114	0/0	8/55	5/59	0/0
24-Jun-2025	740	333	11	187	0/0	6/129	5/58	0/0
25-Jun-2025	695	348	11	196	0/0	7/152	3/43	1/1
14-Jul-2025	696	195	6	9	6/8	0/0	0/0	0/0
29-Jul-2025	801	369	12	291	1/9	6/187	5/95	0/0
28-Aug-2025	715	294	7	34	0/0	2/17	4/15	1/2
Totals	**12,354**	**5,283**	**193**	**3,195**	**22/48**	**58/963**	**96/2,163**	**18/22**

Key: No. = number

[a] Sperm, pilot, and beaked whales

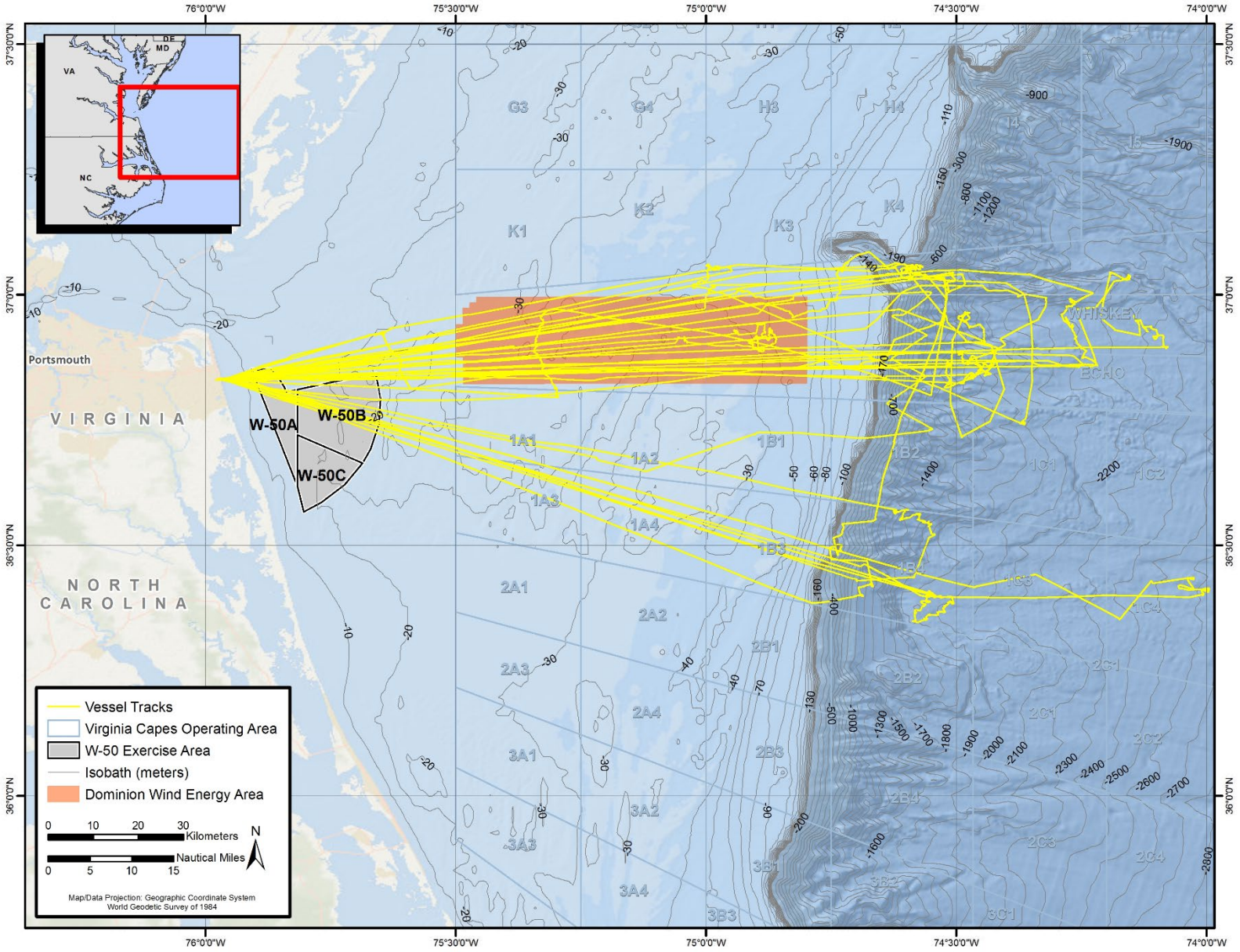

Figure 2. Offshore survey tracks (yellow lines) for all surveys conducted during the 2024/25 field season.

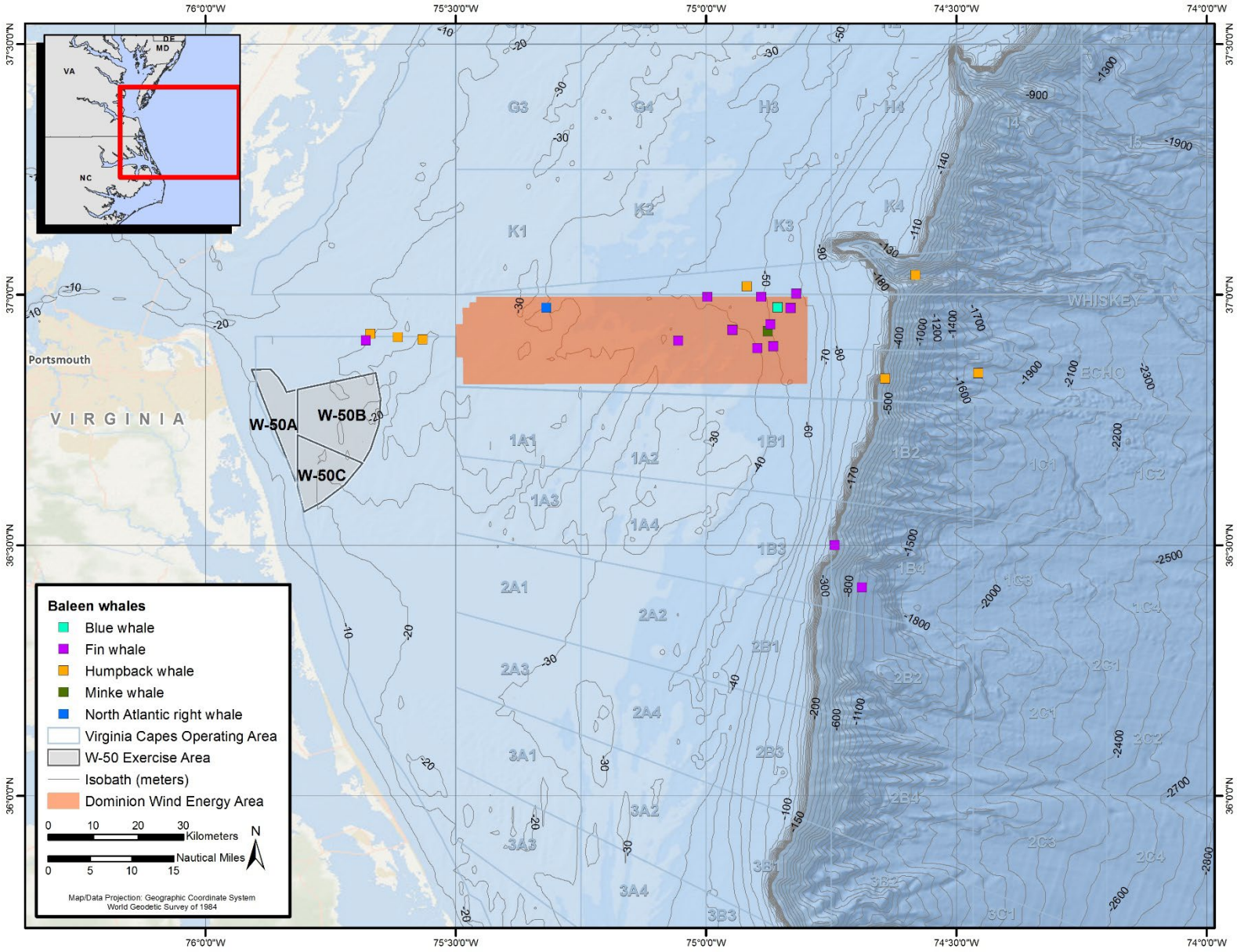

Figure 3. Locations of all baleen whale sightings (*n*=22) during 2024/25 OCS surveys.

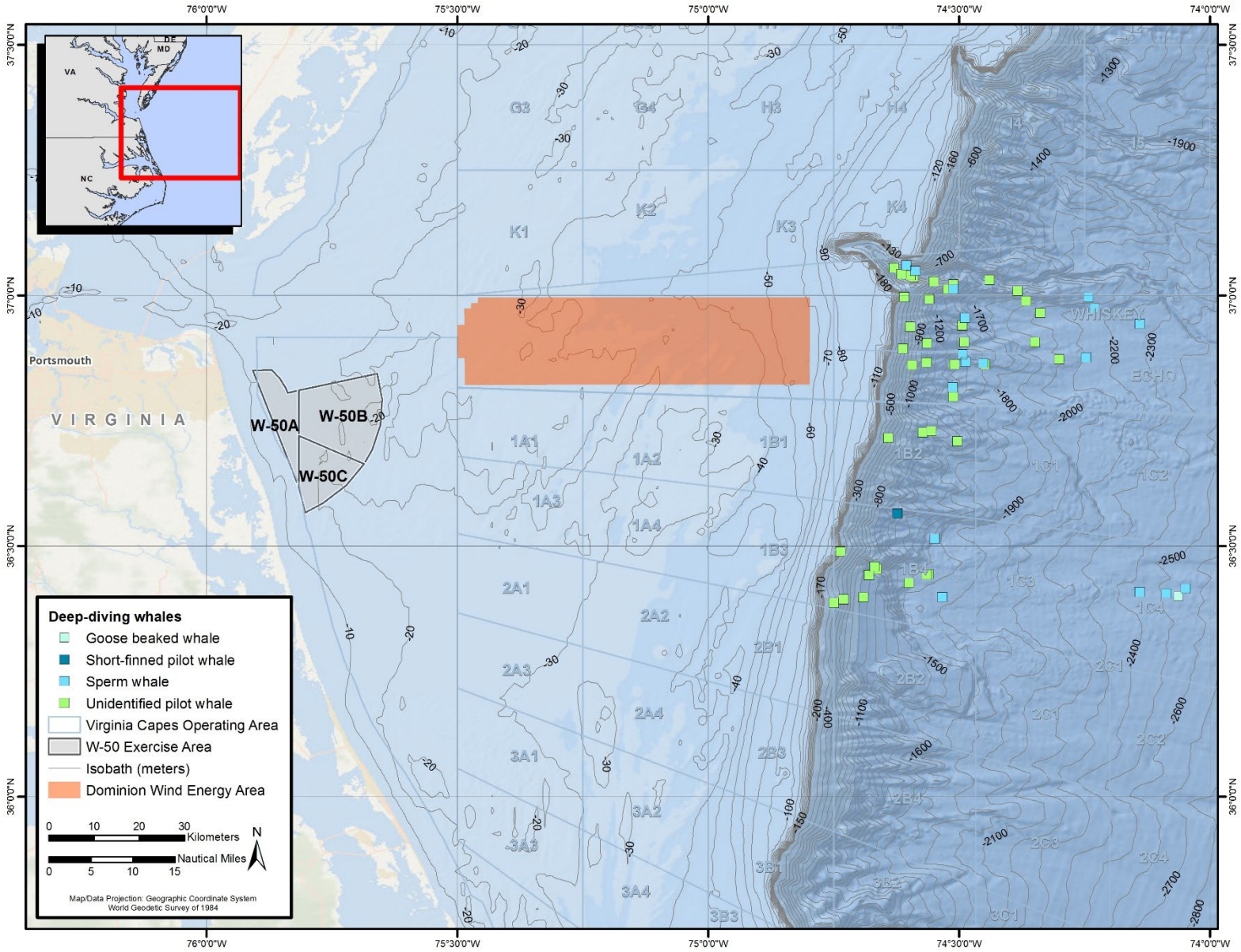

Figure 4. Locations of all deep diving whale sightings (*n*=58) during 2024/25 OCS surveys.

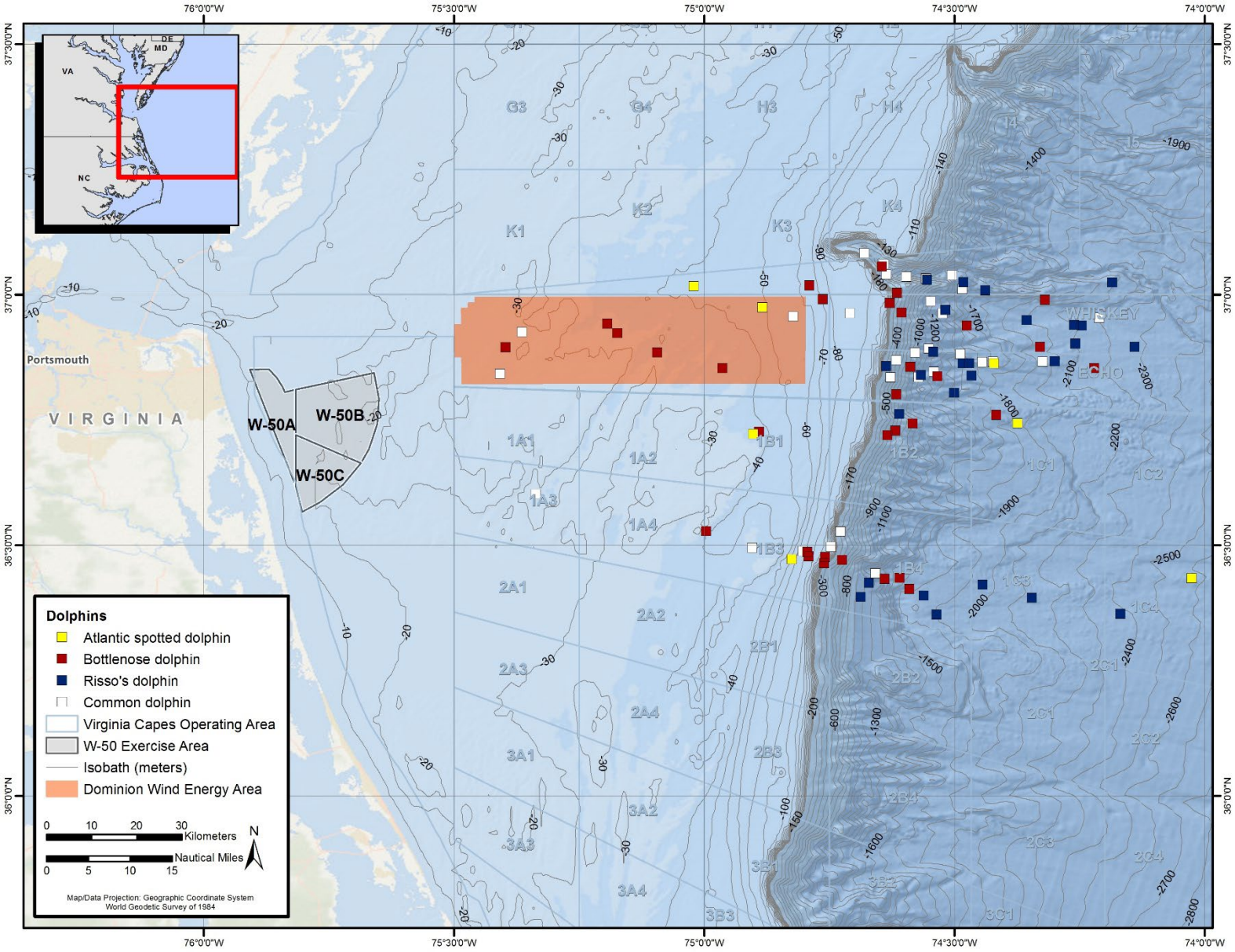

Figure 5. Locations of all dolphin sightings (*n*=96) during 2024/25 OCS surveys.

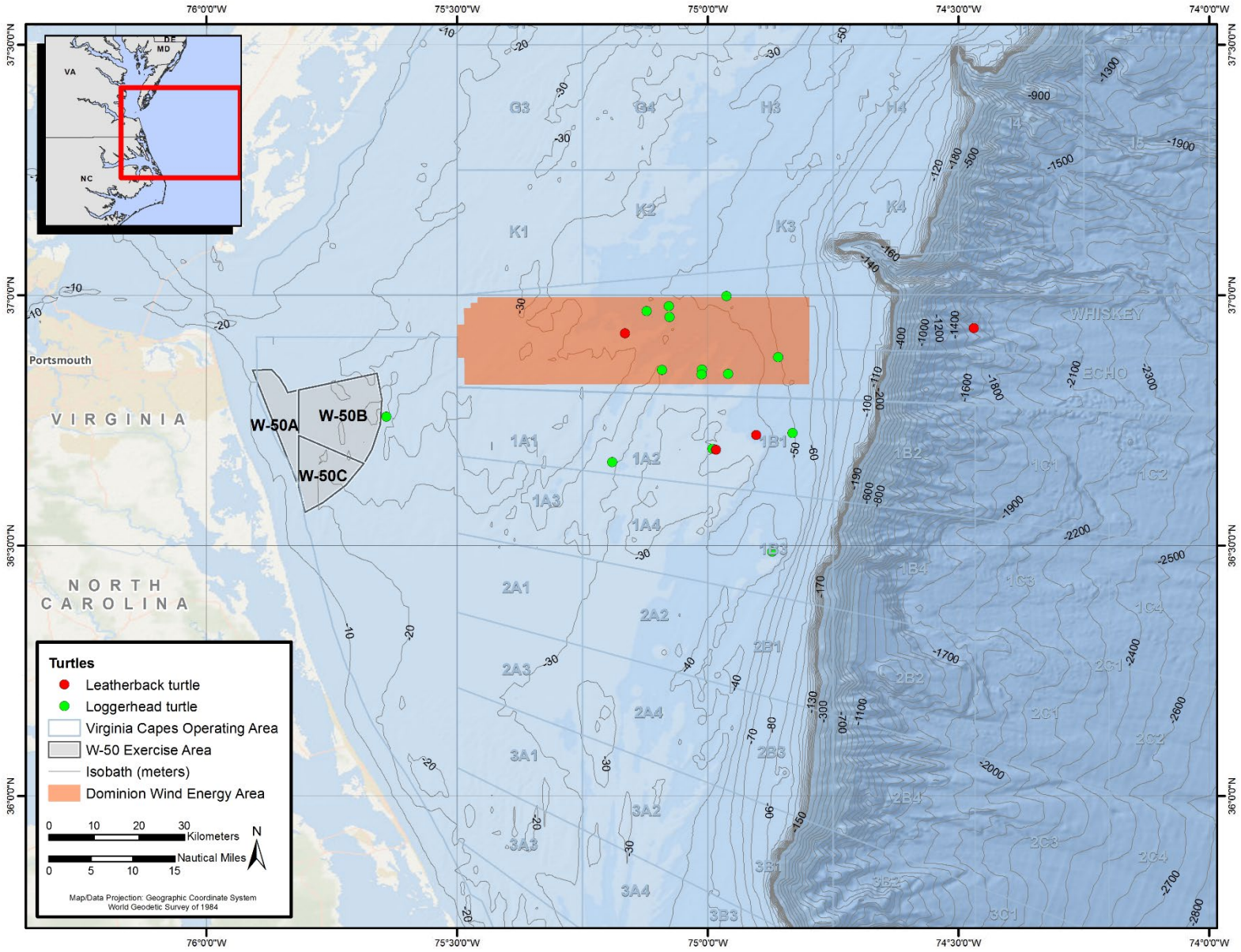

Figure 6. Locations of all sea turtle sightings (*n*=18) during 2024/25 OCS surveys.

3.1 Photo-identification and Photogrammetry

Photo-ID images were collected from 55 of the 176 marine mammal sightings. All photographs of baleen whales were added to HDR's existing catalogs, and results are reported in Aschettino et al. 2026. Photographs were collected of 49 individual sperm whales during the 2024/25 season, consisting of 44 unique identified individuals. All photo-IDs were added to the sperm whale catalog (**Appendix C**), which now contains 185 individuals. The majority of sperm whale individuals photographed during the reporting period were new to the catalog (40 of 44, 90.1 percent). A group sighted 11 May 2025 included one individual initially sighted by HDR in August 2017 (HDRVAPm023) and again in July 2022. Many individuals from that 11 May 2025 group were re-sighted together on 28 August 2025. Five individuals were new to the catalog, and four of the five were re-sighted the following day. Of the total catalog of 185 individuals, 31 (16.7 percent) were sighted on more than 1 day, ranging from 1 to 2,947 days between first and last sightings (mean = 769, median = 428).

Pilot whale photographs have been provided to Duke University; the addition of 2025 data brings the catalog size to 344 individuals (Waples et al. 2026). Comparisons to its Cape Hatteras catalog have been completed a total of 11 individuals that have been re-sighted within this study area and 47 matches to the Cape Hatteras study area (Waples et al. 2026).

3.2 Biopsy Sample Collection and Genetic Analysis

Four biopsies were collected from sperm whales between September 2024 and August 2025 (**Appendix C**). Processing for these as well as the five samples collected during 2023 and 2024 was completed by Oregon State University. One 2025 sample was a genetic match to a female sampled in 2017, not matched using photo-ID because the earlier sighting did not include fluke photos. One sample was not large enough to produce conclusive gender results but did generate a haplotype. The sampled individuals consisted of three females, five males, and one undetermined; one was haplotype C and the remaining eight were haplotype A.

3.3 Satellite Tagging

Seven satellite tags were successfully deployed between September 2024 and August 2025: five on sperm whales, one on a humpback whale, and one on a fin whale (see **Table 2**). Data from the humpback and fin whale tags have been added to the baleen whale tag dataset and are reported in the *Mid-Atlantic Nearshore and Mid-shelf Baleen Whales Monitoring Project* annual report (Aschettino et al. 2026).

The five sperm whale tags were SPLASH10 tags, which collected both location and dive depth/duration information (**Table 2** through **Table 4**). Tag durations for sperm whales ranged from 5.3 to 15.6 days (**Table 2**). Locations from all satellite-tagged sperm whales showed movements throughout the VACAPES OPAREA (**Figure 7** through **Figure 11**), with two individuals, HDRVAPm166 and HDRVAPm184, whose tracks continued northeast of VACAPES along the shelf break, through the Atlantic City and Narragansett OPAREAs north of the study area (**Figure 10** and **Figure 11**). The travel pattern was very similar between the two individuals despite being tagged approximately 1 month apart. HDRVAPm166 traveled over the continental shelf for a short period within the Narragansett OPAREA; however, HDRVAPm184 never did,

even though the end locations were farther northeast with similar tag durations. Within the VACAPES OPAREA, the tagged sperm whales that remained for the entire tag duration spent time in the boxes along the continental shelf break, including I4, I5, 1B4, 2B2, 2B4, 2C2, and 2C3, as well as the Whiskey and Echo Corridors (**Figure 7** through **Figure 11**).

Tagged sperm whales traveled up to 856 km from the initial tag deployment locations, and 34.1 to 100.0 percent of their locations were within the VACAPES OPAREA (**Table 3**). Maximum dive depths ranged from 1,439 to 1,791 m, and maximum dive durations ranged from 46.1 to 64.5 min (**Table 4**).

Table 2. Summary of tag deployment details for all sperm whale tags deployed in 2024/25.

Animal ID	Tag Type	Argos ID	Deployment (GMT)	Deployment Latitude (°N)	Deployment Longitude (°W)	Depth at Tagging Location (m)	Last Transmission (GMT)	Tag Duration (days)
HDRVAPm153	SPLASH10	229396	2025-May-07 17:58	36.8932	74.2484	1,880	2025-May-19 00:59	11.2
HDRVAPm116	SPLASH10	229397	2025-May-11 17:39	36.8512	74.4151	1,428	2025-May-27 00:51	15.2
HDRVAPm023	SPLASH10	233707	2025-May-11 18:26	37.8329	74.4703	1,428	2025-May-17 17:29	5.3
HDRVAPm166	SPLASH10	229398	2025-May-25 17:46	37.0272	74.5042	1,161	2025-Jun-10 01:47	15.3
HDRVAPm184	SPLASH10F	229399	2025-Jun-24 17:31	37.8339	74.4671	1,550	2025-Jul-10 08:29	15.6

Key: GMT = Greenwich Mean Time; ID = Identification Number; °N = degrees North; °W = degrees West

Table 3. Summary of results from satellite-tag data for all sperm whale tags deployed in 2024/25.

Animal ID	Argos ID	No. of Locations Post Filtering	% Within VACAPES OPAREA	Max Distance from Initial Location (km)	Mean Distance from Initial Location (km)
HDRVAPm153	229396	133	100.0	110.2	57.6
HDRVAPm116	229397	192	100.0	129.8	54.6
HDRVAPm023	233707	62	100.0	110.4	51.0
HDRVAPm166	229398	168	39.3	656.8	294.0
HDRVAPm184	229399	135	34.1	856.5	362.9

Key: ID = Identification Number; Max = maximum; No. = number

Table 4. Summary of dive data for all sperm whale SPLASH10 tags deployed in 2024/25.

Animal ID	Argos ID	No. Dives Logged	Mean Dive Depth (m)	Max Dive Depth (m)	Mean Dive Duration (min)	Max Dive Duration (min)
HDRVAPm153	229396	163	949.3	1,439	37.13	47.18
HDRVAPm116	229397	278	817.2	1,791	34.32	46.15
HDRVAPm023	233707	117	656.1	1,759	39.47	50.48
HDRVAPm166	229398	278	909.8	1,695	39.89	51.68
HDRVAPm184	229399	255	1,010.4	1,535	46.62	64.48

Key: ID = Identification Number; Max = maximum; No. = number

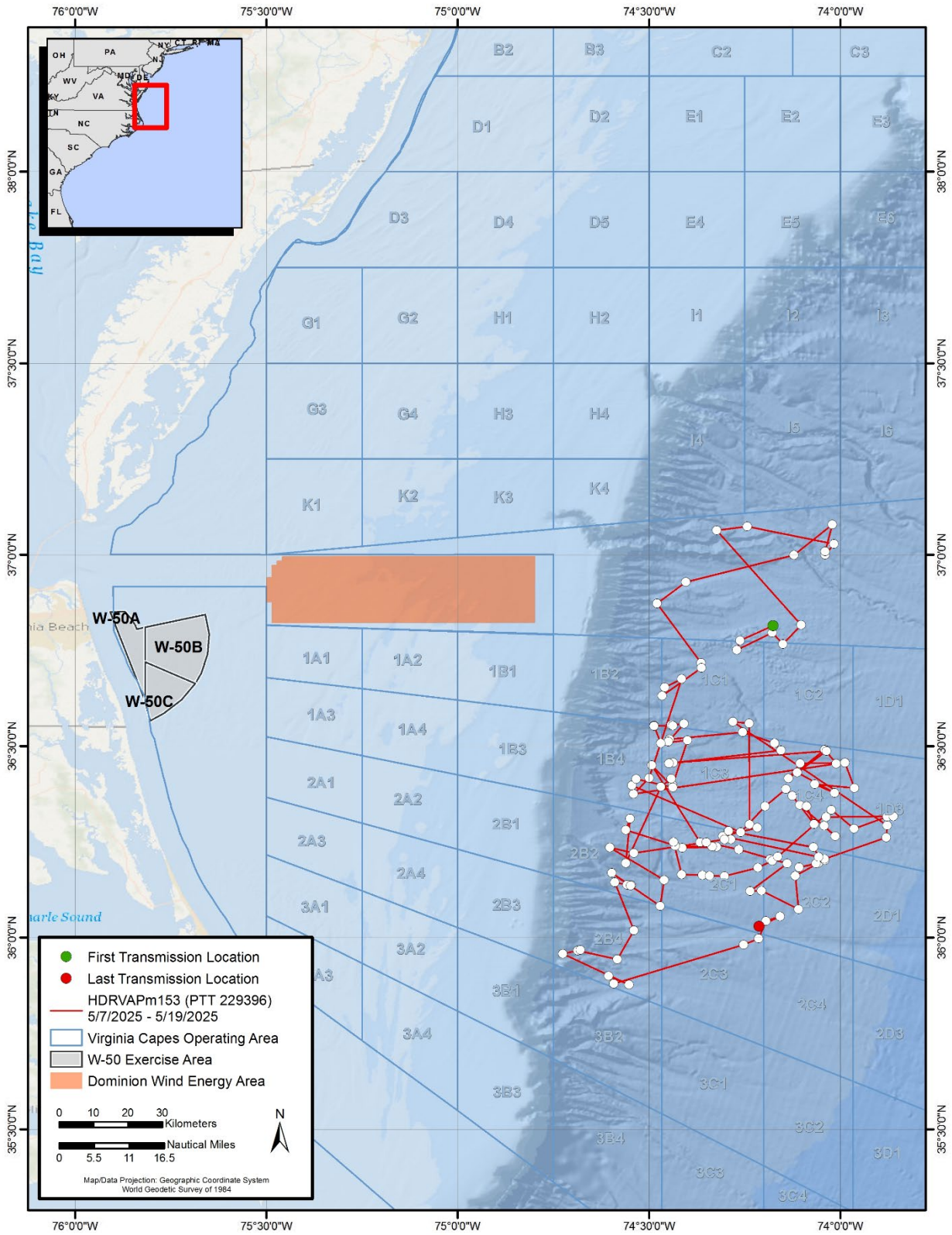

Figure 7. Filtered Argos locations (white dots) and track (red lines) of sperm whale HDRVAPm153 over 11.2 days.

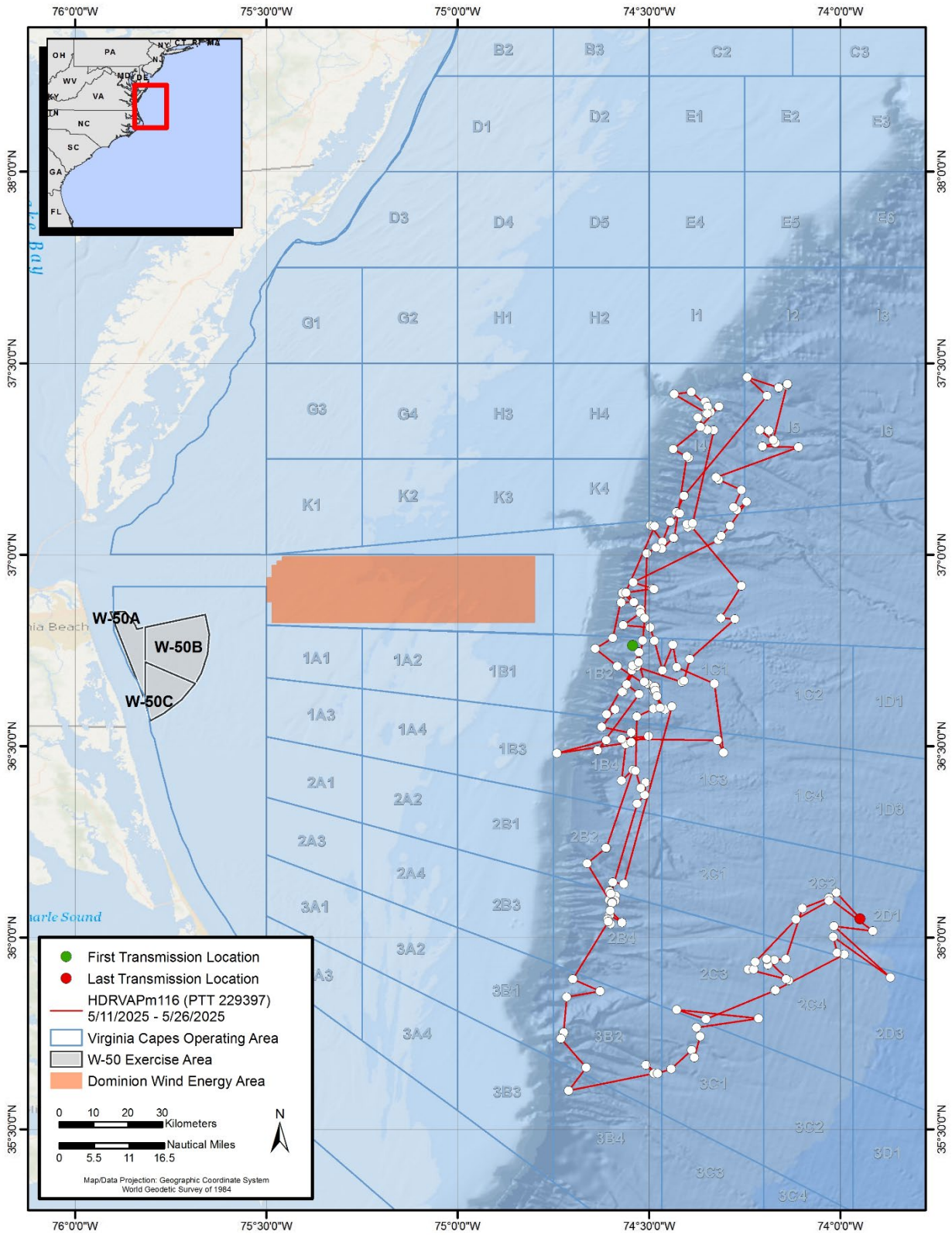

Figure 8. Filtered Argos locations (white dots) and track (red lines) of sperm whale HDRVAPm116 over 15.2 days.

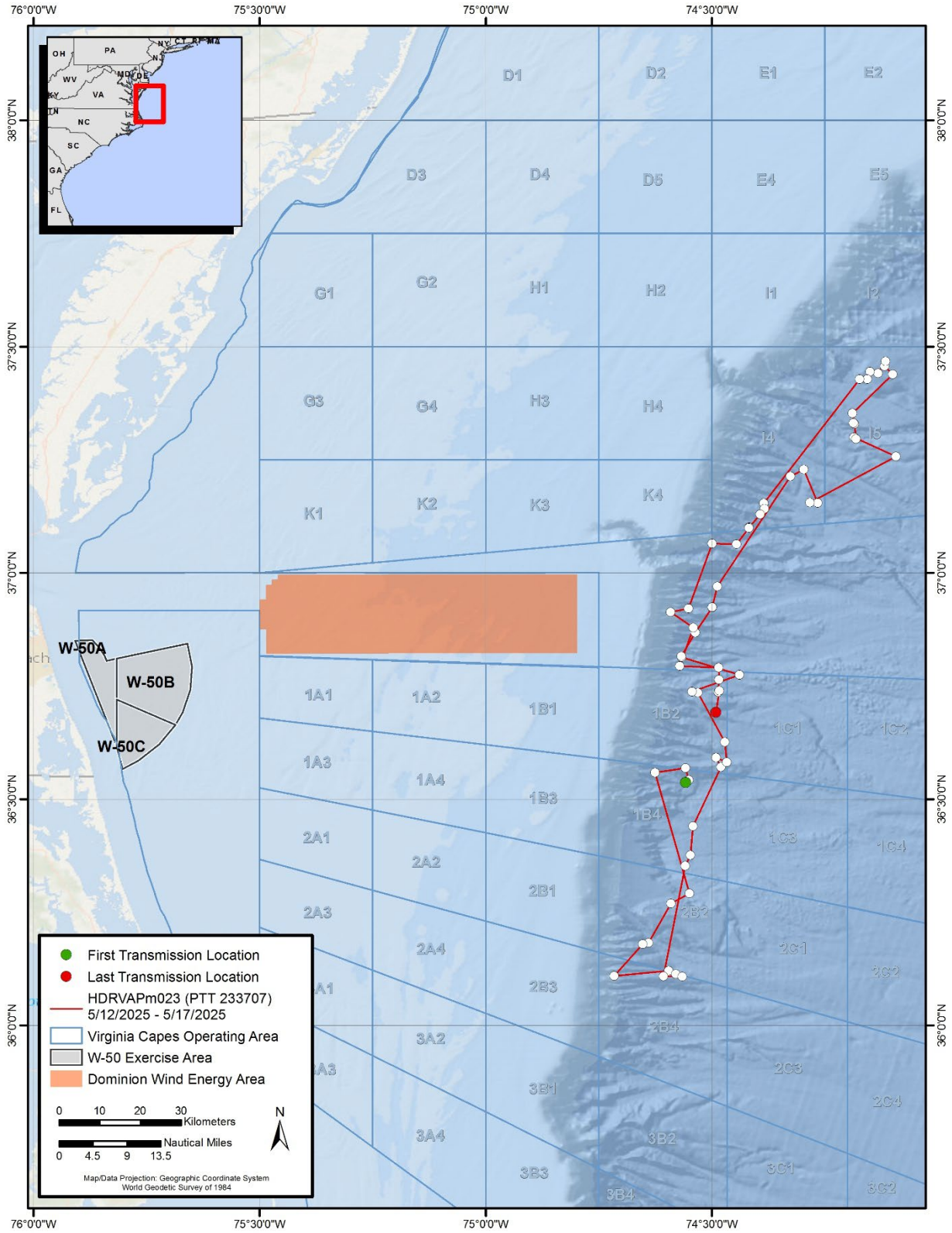

Figure 9. Filtered Argos locations (white dots) and track (red lines) of sperm whale HDRVAPm023 over 5.3 days.

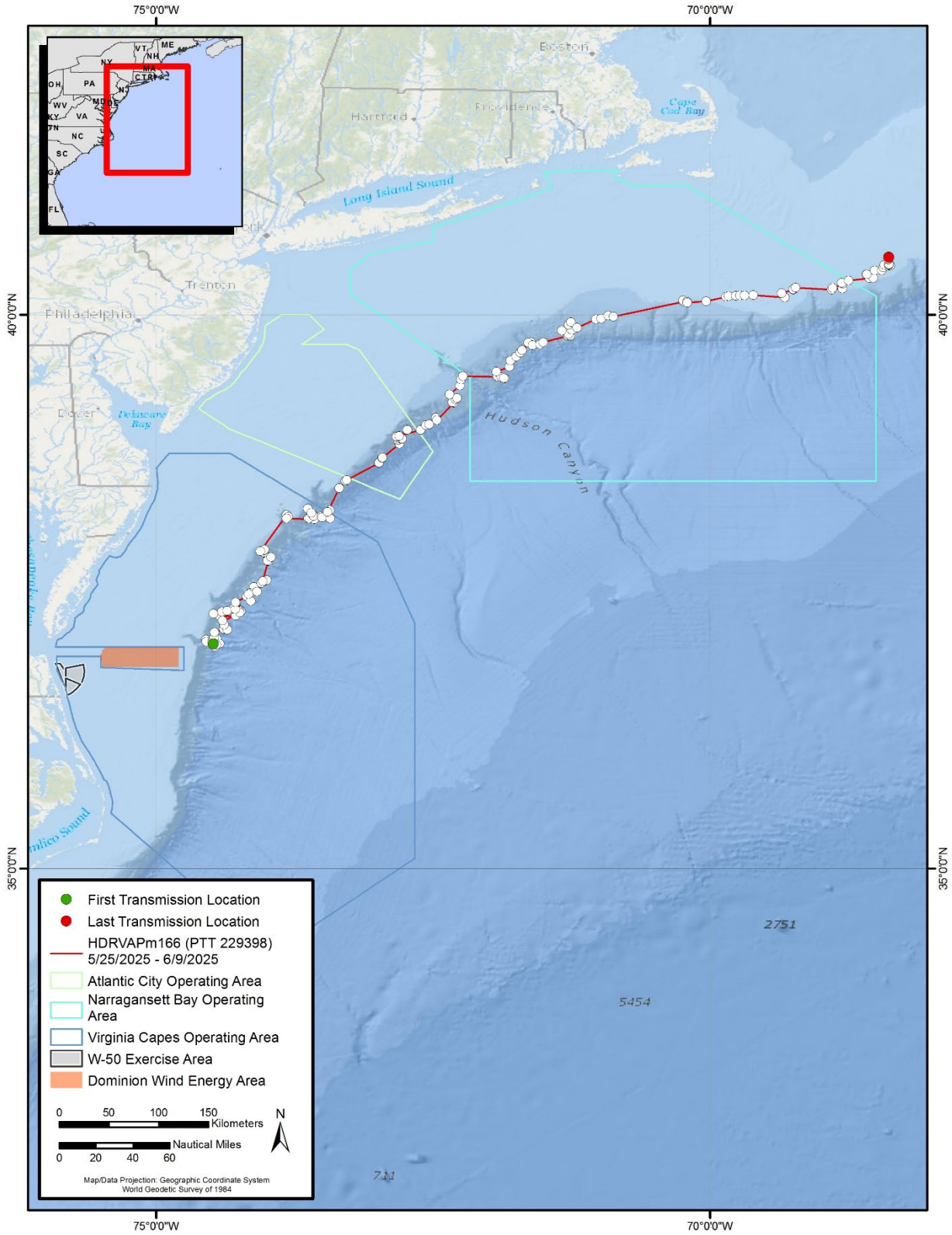

Figure 10. Filtered Argos locations (white dots) and track (red lines) of sperm whale HDRVAPm166 over 15.3 days.

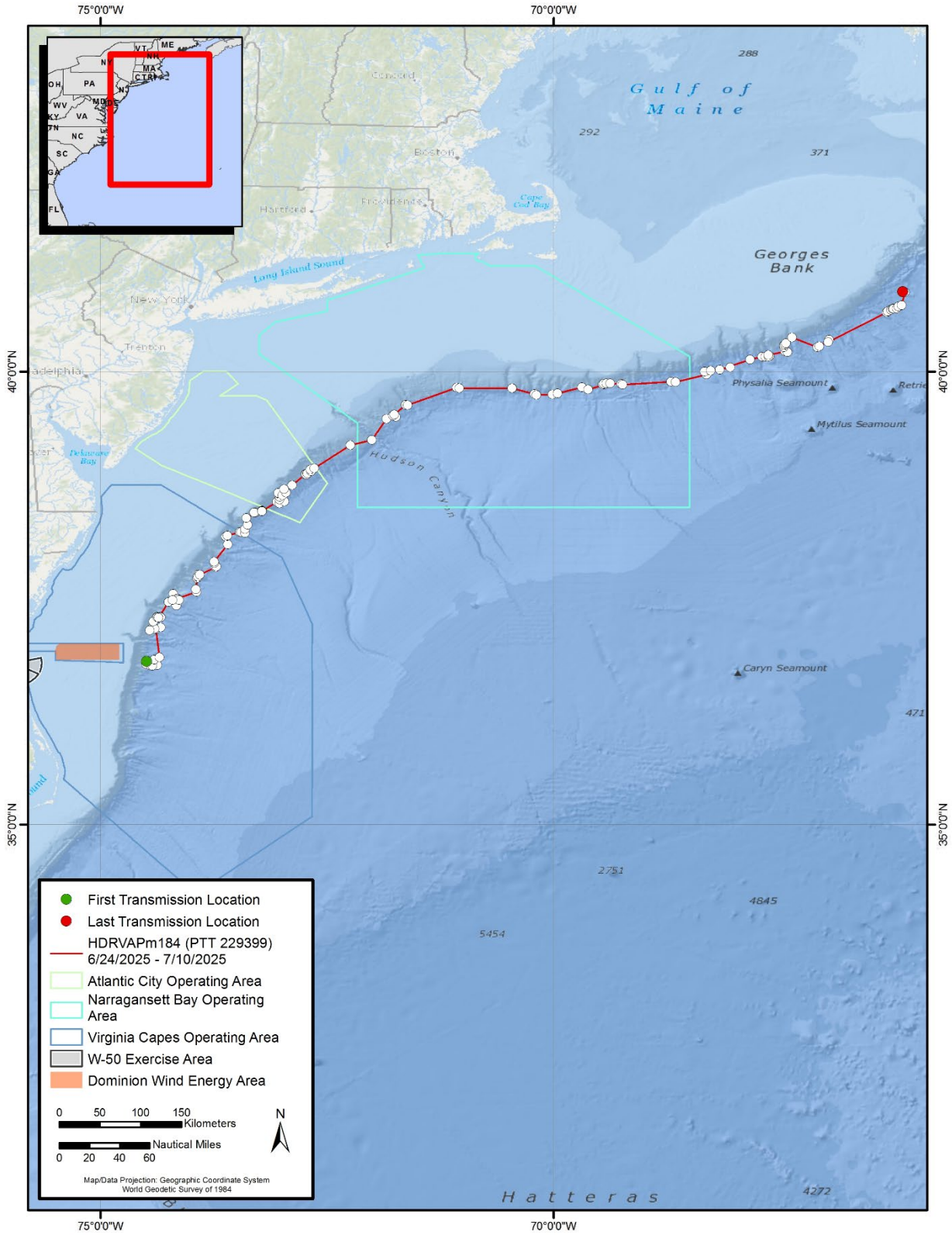

Figure 11. Filtered Argos locations (white dots) and track (red lines) of sperm whale HDRVAPm184 over 15.6 days.

3.4 Digital Archival Tag Results

Two successful DTAG deployments and four successful CATS tag deployments occurred during the 2024/25 reporting period on sperm whales (**Table 5** and **Table 6**), and one CATS tag was deployed on a humpback whale during this period. The humpback whale results are reported in the *Mid-Atlantic Nearshore and Mid-shelf Baleen Whales Monitoring Project* annual report (Aschettino et al. 2026). One sperm whale DTAG could not be recovered because it did not release as programmed before the battery died.

Acoustic audits were completed for the five sperm whale archival tag deployments. Audit results and dive profiles for each individual are shown in **Figure 12** through **Figure 16**. Depth calibrations for one tag dataset, pm25_127a, resulted in an error so uncalibrated depths are shown in **Figure 12**. All individuals displayed consistent foraging dives to depths in the 600- to 1,000-m range throughout the deployments, with some shallower foraging dives and periods at the surface with increased social vocalizations. Maximum dive depths ranged from 334 to 1,233 m (mean = 818, median = 833). Foraging dives consistently terminated above the sea floor.

Table 5. Successful DTAG deployment details.

Animal ID	Species	DTAG No./ Deployment ID	Deployment (GMT)	Depth at Tagging (m)	Tag Off Animal (GMT)	Tag Duration (min)	Gender
HDRVAPm156	Sperm whale	338/ pm25_127a	2025-May-07 19:15	1,880	2025-May-08, 08:54 [a]	945[a]	Unknown
HDRVAPm168	Sperm whale	338/ pm25_154a	2025-Jun-03 15:08	1,860	— [b]	— [b]	Unknown

Key: ID = Identification Number; N/A = not applicable; No. = number; GMT = Greenwich Mean Time
[a] Research team was not present during tag release; the tag-off time and tag duration are estimated
[b] Tag failed to release before battery died. Not recovered

Table 6. Successful CATS tag deployment details.

Animal ID	Species	CATS Tag No./ Deployment ID	Deployment (GMT)	Depth at Tagging (m)	Tag Off Animal (GMT)	Tag Duration (min)	Gender
HDRVAPm155	Sperm whale	CATS 002/ pm250507	2025-May-07 16:58	1,880	2025-May-09 07:43 [a]	2,325[a]	Unknown
HDRVAPm123	Sperm whale	CATS 003/ pm250511	2025-May-11 12:56	1,428	2025-May-11 16:37	220	Female [b]
HDRVAPm169	Sperm whale	CATS 002/ pm250603	2025-Jun-03 17:10	1,860	2025-Jun-04, 09:21[a]	971[a]	Unknown
HDRVAPm181	Sperm whale	CATS 002/ pm250624	2024-Jun-24 15:18	1,550	2025-Jun-25, 00:49 [a]	571[a]	Unknown

Key: ID = Identification Number; N/A = not applicable; No. = number; GMT = Greenwich Mean Time
[a] Research team was not present during tag release; the tag-off time and tag duration are estimated
[b] Gender assumed based on presence of calf

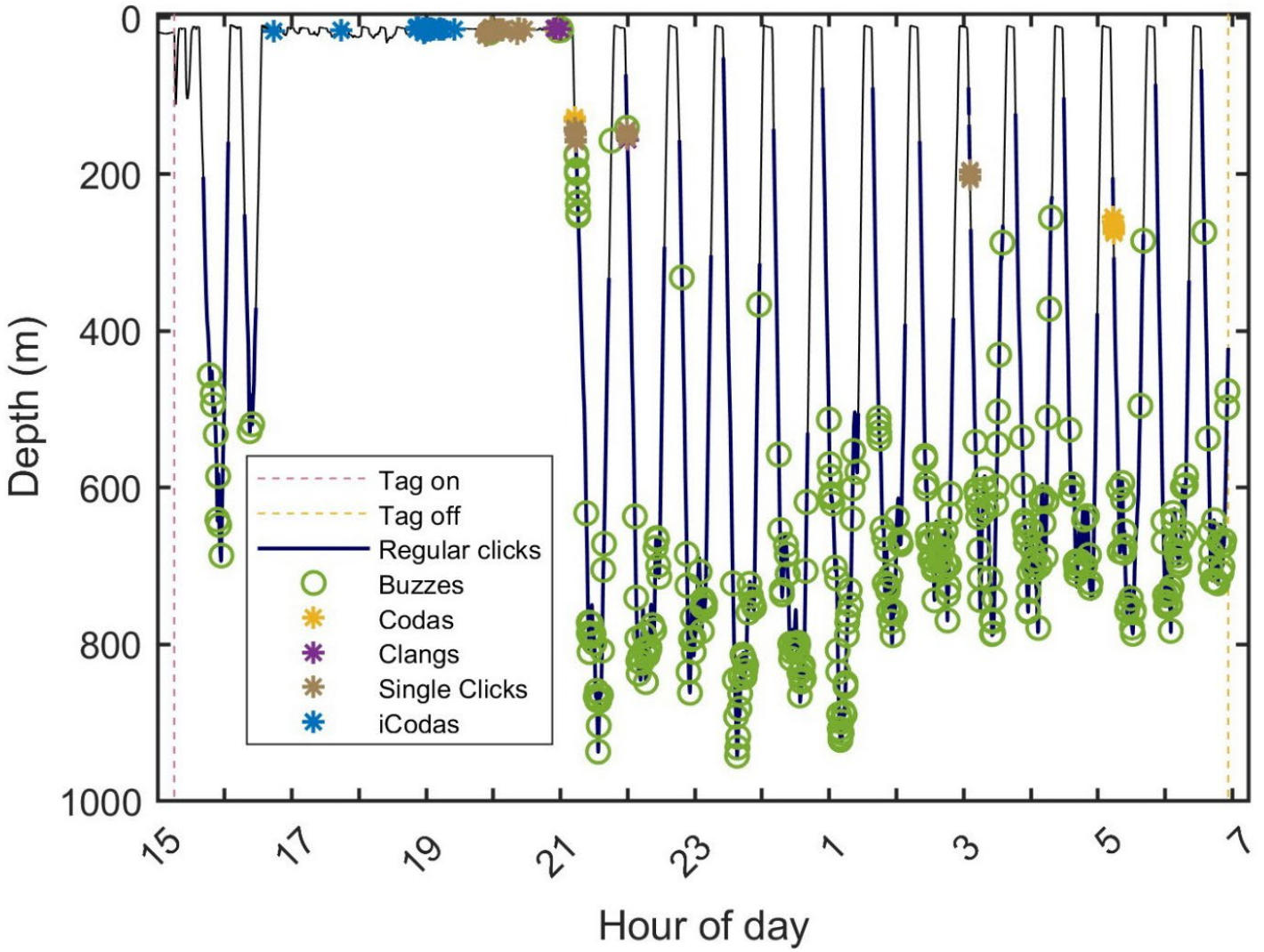

Figure 12. Acoustic audit results for DTAG dataset pm25_127a plotted with the dive profile. The blue lines indicate clicking, and green circles indicate buzzing from the tagged animal. Yellow stars indicate tagged animal codas, blue stars indicate codas which were not possible to assign to tagged or nearby individuals. Clangs and single clicks are represented by purple and brown stars, respectively. The pink dashed line marks the tag deployment time, and the yellow dashed line marks the tag-off-animal time.

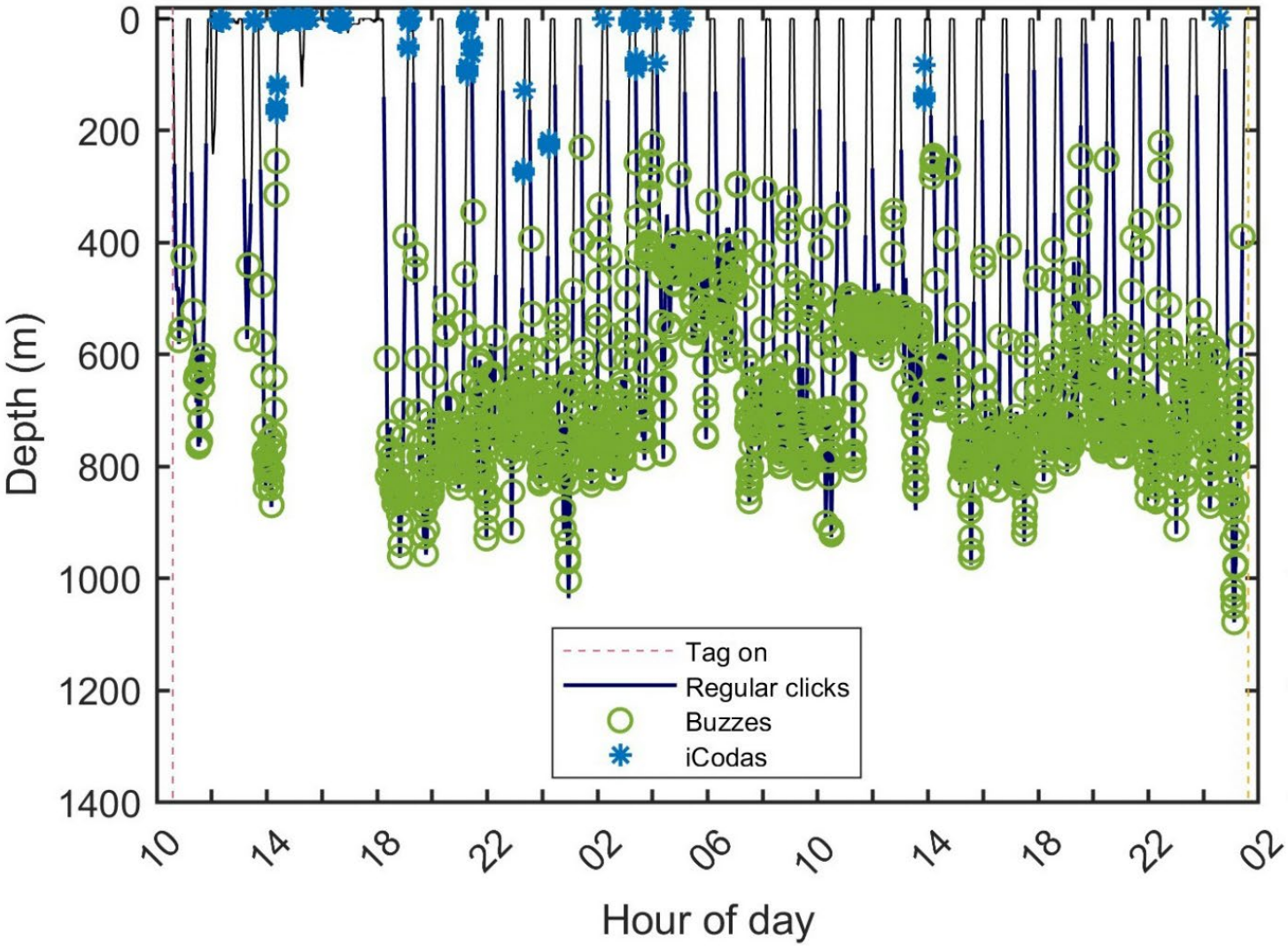

Figure 13. Acoustic audit results for CATS tag dataset pm250507 plotted with the dive profile. The blue lines indicate clicking, and green circles indicate buzzing from the tagged animal. Blue stars indicate codas which were not possible to assign to tagged or nearby individuals. The pink dashed line marks the tag deployment time, and the yellow dashed line marks the tag-off-animal time.

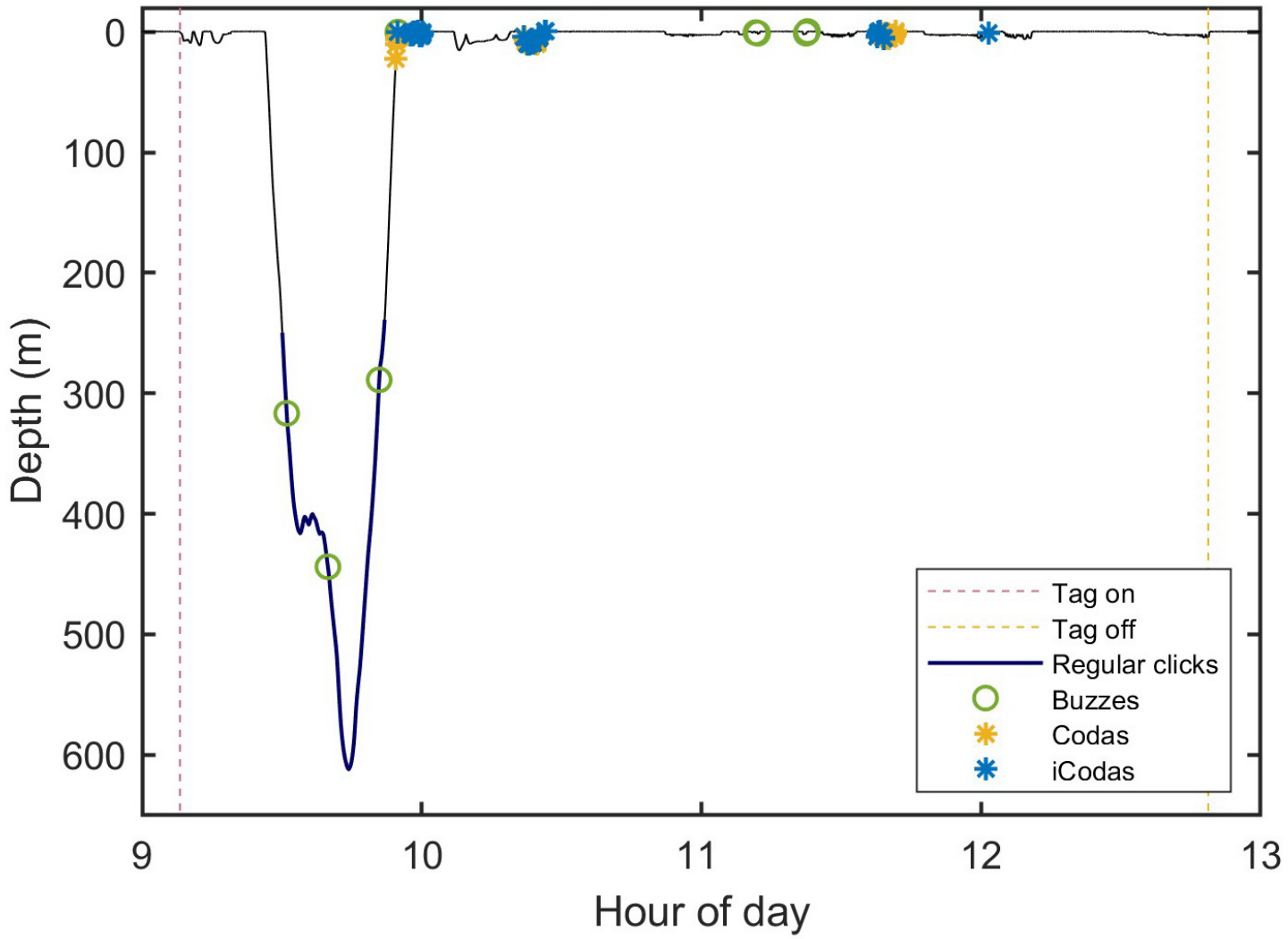

Figure 14. Acoustic audit results for CATS tag dataset pm250511 plotted with the dive profile. The blue lines indicate clicking, green circles indicate buzzing from the tagged animal. Yellow stars indicate tagged animal codas, blue stars indicate codas which were not possible to assign to tagged or nearby individuals. The pink dashed line marks the tag deployment time, and the yellow dashed line marks the tag-off-animal time.

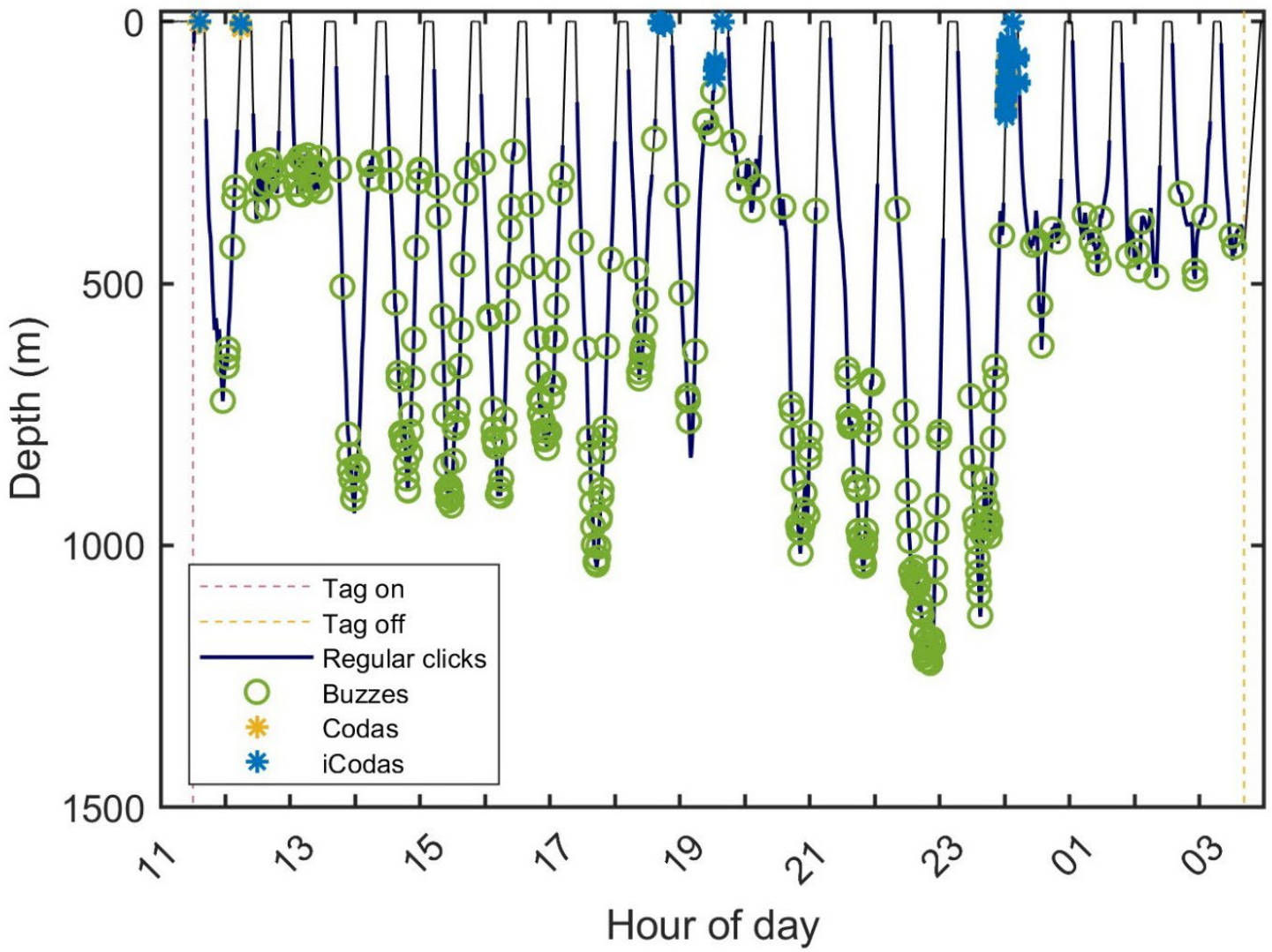

Figure 15. Acoustic audit results for CATS tag dataset pm250603 plotted with the dive profile. The blue lines indicate clicking, green circles indicate buzzing from the tagged animal. Yellow stars indicate tagged animal codas, blue stars indicate codas which were not possible to assign to tagged or nearby individuals. The pink dashed line marks the tag deployment time, and the yellow dashed line marks the tag-off-animal time.

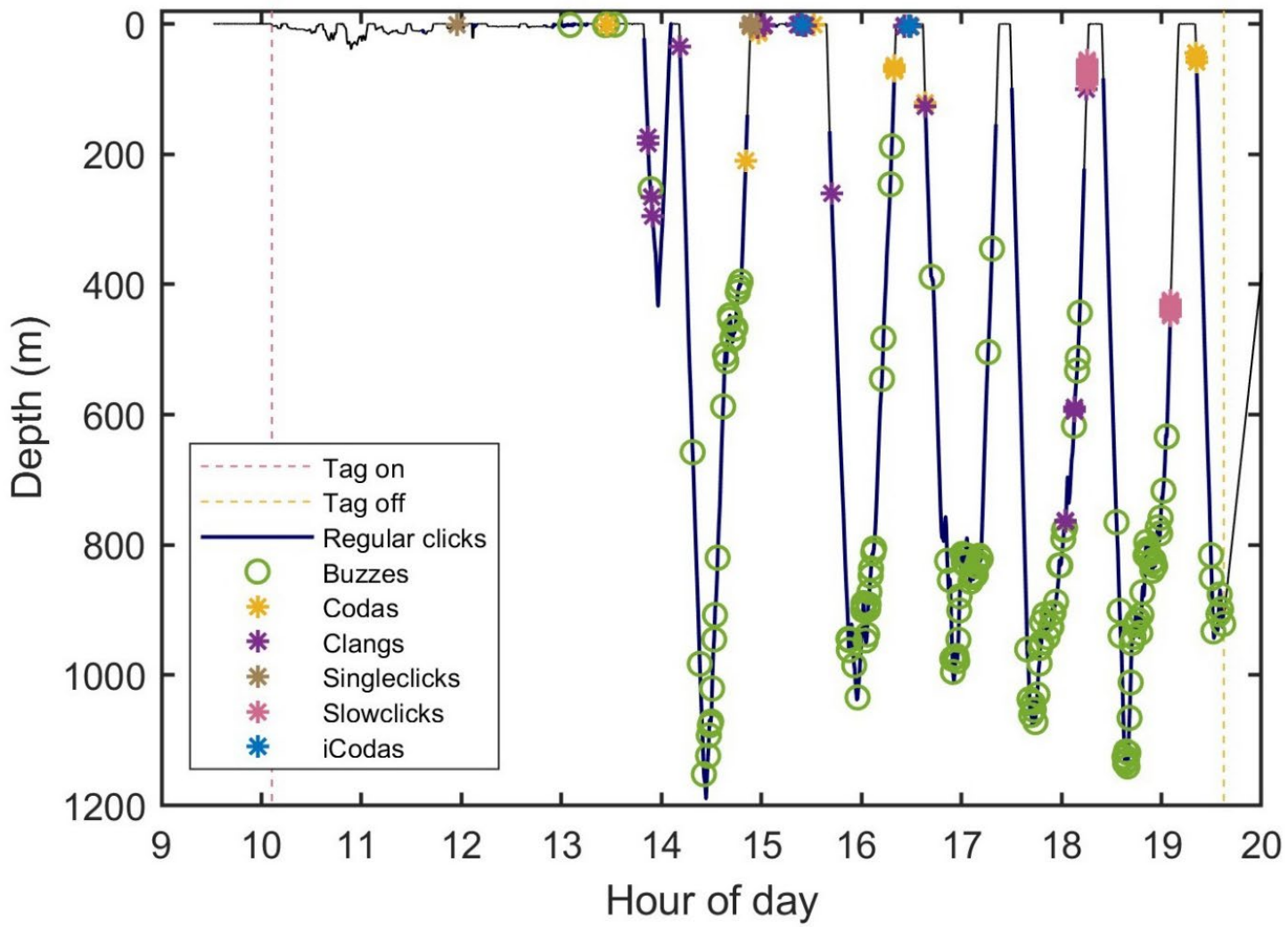

Figure 16. Acoustic audit results for CATS tag dataset pm250624 plotted with the dive profile. The blue lines indicate clicking, and green circles indicate buzzing from the tagged animal. Yellow stars indicate tagged animal codas, blue stars indicate codas which were not possible to assign to tagged or nearby individuals. Clangs, single clicks, and slow clicks are represented by purple, brown, and pink stars, respectively. The pink dashed line marks the tag deployment time, and the yellow dashed line marks the tag-off-animal time.

4. Discussion

Results from the 2024/25 OCS field season continue to demonstrate the biological importance of offshore waters within and adjacent to the VACAPES OPAREA, particularly along the outer continental shelf, shelf break, slope, and associated canyon systems. Consistent with findings from previous OCS field seasons as well as regional aerial and passive acoustic monitoring efforts, surveys conducted during 2024/25 documented persistent use of the study area by a diverse assemblage of cetaceans, including multiple species listed under the ESA. These results directly address the study's objectives of characterizing cetacean occurrence, movement patterns, and potential overlap with U.S. Navy training and testing activities in offshore Mid-Atlantic waters.

Spatial patterns observed during the 2024/25 field season remain consistent with established OCS findings. Deep-diving species, including sperm and pilot whales, were encountered beyond the shelf break as well as within slope and canyon habitats. Baleen whales were observed both over the shelf and near the shelf break. Dolphin species were distributed broadly throughout the study and transit areas, while sea turtle sightings were largely restricted to shelf waters, except one leatherback sighted off the shelf. Continued concentration of sightings in bathymetrically complex regions such as Norfolk Canyon reinforces the ecological importance of canyon and slope habitats within the VACAPES OPAREA.

The majority of photographed sperm whale individuals (90.1 percent) had not been sighted previously within the region, possibly due to survey effort extending farther east than during previous seasons, when directing to hydrophone detections. The re-sighting of one individual 8 years (2,947 days) following initial documentation provides additional evidence that some individuals repeatedly use discrete offshore regions within the study area. The genetic matching of this individual, which improved photo-ID results, was an excellent benefit of the multi-method approach used for this study.

Satellite-tagged sperm whales demonstrated a range of movement behaviors, including localized use of shelf break and slope waters as well as broader movements extending beyond the VACAPES OPAREA into adjacent U.S. Navy OPAREAs (**Figure 10** and **Figure 11**). These patterns highlight the importance of considering cetacean exposure across multiple OPAREAs and emphasize that individual animals may experience repeated or cumulative exposure to training activities across spatially connected offshore regions.

Acoustic audit results plotted on the dive profile for sperm whale archival tags show consistent foraging dives for tagged individuals, with regular clicking and buzzes detected (**Figure 12** through **Figure 16**). Some extended periods at or near surface lasting 3 to 4 hours with codas were also recorded on 4 out of 5 archival tag deployments.

These areas likely provide foraging opportunities and may serve as focal regions for repeated use by certain species, particularly sperm whales (an ESA-listed species) as evidenced by sightings, re-sightings, and tag-derived movement data. Integration of movement data with behavioral and acoustic information provides further support of these waters as foraging habitat.

The results of the 2024/25 field season further demonstrate the value of a multi-method monitoring approach that combines vessel-based surveys, photo-ID, biopsy sampling, satellite telemetry, and short-duration archival tagging. Each method contributes unique and complementary information, allowing for a more comprehensive understanding of cetacean ecology and behavior. In particular, integration of subsurface movement and acoustic data is essential for characterizing habitat use and exposure potential in offshore environments where animals spend the majority of their time below the surface.

Ongoing and planned analyses include continued photo-ID matching, expanded evaluation of telemetry tracks, and integration of sighting and movement data with environmental variables to better resolve drivers of habitat use. Continued collaboration with external partners and long-term monitoring will further strengthen the ability to detect interannual variability and refine estimates of seasonal occurrence, site fidelity, and movement patterns. Collectively, the results of this multi-year effort provide the U.S. Navy with scientifically robust information necessary to support environmental planning, regulatory compliance, and adaptive management within the VACAPES OPAREA. As the OCS dataset grows, it will increasingly support informed decision-making aimed at minimizing potential impacts to protected species while maintaining mission readiness.

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Marine Mammal Sightings, 2024/25

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Date	Sighting Time (local)	Scientific Name	Common Name	Est. Group Size	Latitude (°N)	Longitude (°W)
10-Sep-24	13:27	*Globicephala* sp.	Unidentified pilot whale	10	36.9968	74.6088
10-Sep-24	13:58	*Globicephala* sp.	Unidentified pilot whale	10	36.9926	74.5594
10-Sep-24	14:34	*Globicephala* sp.	Unidentified pilot whale	15	36.9376	74.5972
10-Sep-24	14:56	*Globicephala* sp.	Unidentified pilot whale	15	36.9048	74.5638
10-Sep-24	15:28	*Globicephala* sp.	Unidentified pilot whale	10	36.8610	74.5934
10-Sep-24	16:44	*Globicephala* sp.	Unidentified pilot whale	6	36.7295	74.5546
10-Sep-24	17:03	*Globicephala* sp.	Unidentified pilot whale	9	36.7266	74.5721
10-Sep-24	17:25	*Globicephala* sp.	Unidentified pilot whale	16	36.7158	74.6411
10-Sep-24	12:40	*Stenella frontalis*	Atlantic spotted dolphin	85	36.9744	74.8841
10-Sep-24	18:27	*Stenella frontalis*	Atlantic spotted dolphin	6	36.7221	74.9024
10-Sep-24	11:31	*Tursiops truncatus*	Bottlenose dolphin	125	36.8949	75.3971
10-Sep-24	12:03	*Tursiops truncatus*	Bottlenose dolphin	2	36.9231	75.1734
10-Sep-24	12:58	*Tursiops truncatus*	Bottlenose dolphin	6	36.9909	74.7630
10-Sep-24	13:24	*Tursiops truncatus*	Bottlenose dolphin	12	37.0031	74.6147
10-Sep-24	14:14	*Tursiops truncatus*	Bottlenose dolphin	15	36.9642	74.6056
10-Sep-24	15:32	*Tursiops truncatus*	Bottlenose dolphin	11	36.8556	74.5884
10-Sep-24	16:07	*Tursiops truncatus*	Bottlenose dolphin	120	36.8013	74.6161
10-Sep-24	16:36	*Tursiops truncatus*	Bottlenose dolphin	18	36.7430	74.5837
10-Sep-24	17:24	*Tursiops truncatus*	Bottlenose dolphin	20	36.7192	74.6340
10-Sep-24	18:22	*Tursiops truncatus*	Bottlenose dolphin	6	36.7264	74.8901
23-Feb-25	15:00	*Physeter macrocephalus*	Sperm whale	1	37.0598	74.6050
23-Feb-25	14:43	*Delphinus delphis*	Short-beaked common dolphin	7	37.0600	74.6410
23-Feb-25	22:10	*Balaenoptera physalus*	Fin whale	1	36.9084	75.6792
23-Feb-25	12:37	*Megaptera novaeangliae*	Humpback whale	2	36.9104	75.5657
23-Feb-25	21:47	*Megaptera novaeangliae*	Humpback whale	4	36.9152	75.6153
24-Feb-25	14:40	*Physeter macrocephalus*	Sperm whale	1	37.0489	74.5878
24-Feb-25	18:13	*Physeter macrocephalus*	Sperm whale	4	36.8169	74.5123
24-Feb-25	18:00	*Grampus griseus*	Risso's dolphin	5	36.8382	74.4663
24-Feb-25	16:43	*Delphinus delphis*	Short-beaked common dolphin	12	36.9864	74.5479
24-Feb-25	21:30	*Delphinus delphis*	Short-beaked common dolphin	20	36.8422	75.4078
24-Feb-25	11:44	*Megaptera novaeangliae*	Humpback whale	7	36.9219	75.6703
24-Feb-25	14:37	*Megaptera novaeangliae*	Humpback whale	1	37.0390	74.5814
24-Feb-25	17:57	*Megaptera novaeangliae*	Humpback whale	1	36.8435	74.4563
10-Mar-25	13:15	*Globicephala* sp.	Unidentified pilot whale	7	37.0277	74.5505
10-Mar-25	13:52	*Grampus griseus*	Risso's dolphin	7	37.0249	74.4824
10-Mar-25	14:18	*Grampus griseus*	Risso's dolphin	5	36.9695	74.5184
10-Mar-25	12:49	*Delphinus delphis*	Short-beaked common dolphin	25	37.0397	74.6367
10-Mar-25	13:14	*Delphinus delphis*	Short-beaked common dolphin	25	37.0319	74.5569
10-Mar-25	13:36	*Delphinus delphis*	Short-beaked common dolphin	20	37.0395	74.5053
10-Mar-25	13:54	*Delphinus delphis*	Short-beaked common dolphin	2	37.0113	74.4845

Date	Sighting Time (local)	Scientific Name	Common Name	Est. Group Size	Latitude (°N)	Longitude (°W)
10-Mar-25	14:52	*Delphinus delphis*	Short-beaked common dolphin	15	36.8459	74.5413
10-Mar-25	15:17	*Delphinus delphis*	Short-beaked common dolphin	50	36.8348	74.6279
10-Mar-25	16:42	*Eubalaena glacialis*	North Atlantic right whale	6	36.9742	75.3191
25-Apr-25	12:43	*Globicephala* sp.	Unidentified pilot whale	3	36.3868	74.7492
25-Apr-25	12:50	*Globicephala* sp.	Unidentified pilot whale	4	36.3937	74.7295
25-Apr-25	13:06	*Globicephala* sp.	Unidentified pilot whale	7	36.3980	74.6904
25-Apr-25	14:16	*Tursiops truncatus*	Bottlenose dolphin	2	36.4706	74.7246
25-Apr-25	16:38	*Tursiops truncatus*	Bottlenose dolphin	7	36.7289	74.6185
25-Apr-25	19:53	*Tursiops truncatus*	Bottlenose dolphin	50	36.9417	75.1936
25-Apr-25	13:10	*Grampus griseus*	Risso's dolphin	10	36.3972	74.6870
25-Apr-25	13:32	*Grampus griseus*	Risso's dolphin	28	36.4251	74.6713
25-Apr-25	16:43	*Grampus griseus*	Risso's dolphin	4	36.7617	74.6103
25-Apr-25	16:57	*Grampus griseus*	Risso's dolphin	5	36.8394	74.5670
25-Apr-25	17:51	*Grampus griseus*	Risso's dolphin	7	37.0296	74.5548
25-Apr-25	11:13	*Delphinus delphis*	Short-beaked common dolphin	20	36.6018	75.3362
25-Apr-25	14:33	*Delphinus delphis*	Short-beaked common dolphin	20	36.4971	74.7469
25-Apr-25	15:27	*Delphinus delphis*	Short-beaked common dolphin	100	36.5273	74.7281
25-Apr-25	16:58	*Delphinus delphis*	Short-beaked common dolphin	30	36.8356	74.5717
25-Apr-25	17:15	*Delphinus delphis*	Short-beaked common dolphin	50	36.8921	74.5514
25-Apr-25	17:28	*Delphinus delphis*	Short-beaked common dolphin	12	36.9629	74.5240
25-Apr-25	18:10	*Delphinus delphis*	Short-beaked common dolphin	150	37.0361	74.5957
25-Apr-25	13:18	*Balaenoptera physalus*	Fin whale	1	36.4157	74.6885
25-Apr-25	14:32	*Balaenoptera physalus*	Fin whale	1	36.4998	74.7426
25-Apr-25	18:45	*Balaenoptera physalus*	Fin whale	1	37.0018	74.8197
7-May-25	14:26	*Physeter macrocephalus*	Sperm whale	4	36.9963	74.2420
7-May-25	18:12	*Physeter macrocephalus*	Sperm whale	2	36.8760	74.2471
7-May-25	12:02	*Tursiops truncatus*	Bottlenose dolphin	6	37.0185	74.7899
7-May-25	20:49	*Tursiops truncatus*	Bottlenose dolphin	17	36.8530	74.9632
7-May-25	17:04	*Grampus griseus*	Risso's dolphin	5	36.9392	74.2610
7-May-25	17:48	*Grampus griseus*	Risso's dolphin	35	36.9019	74.2588
7-May-25	10:48	*Delphinus delphis*	Short-beaked common dolphin	20	36.9259	75.3643
7-May-25	19:37	*Delphinus delphis*	Short-beaked common dolphin	35	36.8661	74.4228
7-May-25	19:41	*Delphinus delphis*	Short-beaked common dolphin	1	36.8654	74.4444
8-May-25	14:46	*Physeter macrocephalus*	Sperm whale	1	36.9737	74.2300
8-May-25	16:46	*Physeter macrocephalus*	Sperm whale	7	36.9436	74.1395
8-May-25	13:24	*Globicephala* sp.	Unidentified pilot whale	9	36.8662	74.5648
8-May-25	13:57	*Globicephala* sp.	Unidentified pilot whale	7	36.8729	74.3000
8-May-25	14:09	*Tursiops truncatus*	Bottlenose dolphin	10	36.8532	74.2207
8-May-25	19:55	*Tursiops truncatus*	Bottlenose dolphin	12	36.8958	74.3293
8-May-25	13:58	*Grampus griseus*	Risso's dolphin	19	36.8667	74.2999

Date	Sighting Time (local)	Scientific Name	Common Name	Est. Group Size	Latitude (°N)	Longitude (°W)
8-May-25	14:30	*Grampus griseus*	Risso's dolphin	5	36.9383	74.2455
8-May-25	15:09	*Grampus griseus*	Risso's dolphin	6	37.0240	74.1851
8-May-25	19:27	*Grampus griseus*	Risso's dolphin	2	36.8955	74.1406
8-May-25	20:22	*Grampus griseus*	Risso's dolphin	6	36.8860	74.5428
8-May-25	13:17	*Delphinus delphis*	Short-beaked common dolphin	60	36.8694	74.6161
8-May-25	13:55	*Delphinus delphis*	Short-beaked common dolphin	5	36.8665	74.3236
8-May-25	16:08	*Delphinus delphis*	Short-beaked common dolphin	10	36.9534	74.2108
8-May-25	20:27	*Delphinus delphis*	Short-beaked common dolphin	175	36.8847	74.5791
11-May-25	12:33	*Physeter macrocephalus*	Sperm whale	5	36.8827	74.4925
11-May-25	19:06	*Tursiops truncatus*	Bottlenose dolphin	60	36.8369	74.5342
11-May-25	14:45	*Grampus griseus*	Risso's dolphin	5	36.8632	74.4840
11-May-25	15:58	*Grampus griseus*	Risso's dolphin	6	36.8630	74.4707
11-May-25	13:17	*Delphinus delphis*	Short-beaked common dolphin	6	36.8815	74.4886
11-May-25	15:48	*Delphinus delphis*	Short-beaked common dolphin	10	36.8629	74.4732
11-May-25	19:21	*Megaptera novaeangliae*	Humpback whale	2	36.8323	74.6421
25-May-25	16:54	*Physeter macrocephalus*	Sperm whale	2	37.0127	74.5114
25-May-25	16:06	*Globicephala* sp.	Unidentified pilot whale	100	37.0551	74.6302
25-May-25	18:43	*Globicephala* sp.	Unidentified pilot whale	25	37.0363	74.5907
25-May-25	16:03	*Tursiops truncatus*	Bottlenose dolphin	25	37.0560	74.6451
25-May-25	13:22	*Delphinus delphis*	Short-beaked common dolphin	5	36.9565	74.8225
25-May-25	15:48	*Delphinus delphis*	Short-beaked common dolphin	6	37.0830	74.6802
25-May-25	12:31	*Balaenoptera musculus*	Blue whale	1	36.9746	74.8572
25-May-25	12:53	*Balaenoptera physalus*	Fin whale	1	36.9730	74.8310
25-May-25	19:21	*Balaenoptera physalus*	Fin whale	1	36.9953	74.8896
25-May-25	19:24	*Megaptera novaeangliae*	Humpback whale	1	37.0162	74.9187
3-Jun-25	12:58	*Physeter macrocephalus*	Sperm whale	10	36.3981	74.5330
3-Jun-25	12:34	*Globicephala* sp.	Unidentified pilot whale	15	36.4266	74.6002
3-Jun-25	18:29	*Globicephala* sp.	Unidentified pilot whale	18	36.4540	74.6638
3-Jun-25	18:31	*Globicephala* sp.	Unidentified pilot whale	100	36.4422	74.6798
3-Jun-25	12:02	*Tursiops truncatus*	Bottlenose dolphin	15	36.4863	74.7939
3-Jun-25	12:07	*Tursiops truncatus*	Bottlenose dolphin	5	36.4768	74.7585
3-Jun-25	12:37	*Tursiops truncatus*	Bottlenose dolphin	40	36.4127	74.5902
3-Jun-25	18:44	*Tursiops truncatus*	Bottlenose dolphin	35	36.4642	74.7604
3-Jun-25	18:48	*Tursiops truncatus*	Bottlenose dolphin	27	36.4778	74.7911
3-Jun-25	14:21	*Grampus griseus*	Risso's dolphin	10	36.3617	74.5361
3-Jun-25	18:16	*Grampus griseus*	Risso's dolphin	15	36.3998	74.5613
3-Jun-25	12:02	*Delphinus delphis*	Short-beaked common dolphin	50	36.4886	74.8028
3-Jun-25	18:30	*Delphinus delphis*	Short-beaked common dolphin	30	36.4443	74.6580
4-Jun-25	14:32	*Ziphius cavirostris*	Cuvier's beaked whale	1	36.3996	74.0626
4-Jun-25	14:22	*Physeter macrocephalus*	Sperm whale	1	36.4083	74.1399

Date	Sighting Time (local)	Scientific Name	Common Name	Est. Group Size	Latitude (°N)	Longitude (°W)
4-Jun-25	14:29	*Physeter macrocephalus*	Sperm whale	1	36.4053	74.0872
4-Jun-25	15:22	*Physeter macrocephalus*	Sperm whale	5	36.4152	74.0481
4-Jun-25	18:55	*Globicephala* sp.	Unidentified pilot whale	12	36.4440	74.5608
4-Jun-25	18:56	*Globicephala* sp.	Unidentified pilot whale	15	36.4429	74.5647
4-Jun-25	19:10	*Globicephala* sp.	Unidentified pilot whale	8	36.4592	74.6682
4-Jun-25	19:19	*Globicephala* sp.	Unidentified pilot whale	12	36.4891	74.7366
4-Jun-25	16:28	*Stenella frontalis*	Atlantic spotted dolphin	8	36.4345	74.0260
4-Jun-25	13:52	*Grampus griseus*	Risso's dolphin	10	36.3950	74.3455
4-Jun-25	17:31	*Grampus griseus*	Risso's dolphin	6	36.3632	74.1686
4-Jun-25	18:35	*Grampus griseus*	Risso's dolphin	10	36.4214	74.4438
4-Jun-25	12:41	*Delphinus delphis*	Short-beaked common dolphin	25	36.4951	74.9043
24-Jun-25	14:27	*Physeter macrocephalus*	Sperm whale	3	36.8670	74.4871
24-Jun-25	16:32	*Physeter macrocephalus*	Sperm whale	1	36.8653	74.4520
24-Jun-25	12:23	*Globicephala* sp.	Unidentified pilot whale	20	37.0127	74.5225
24-Jun-25	12:50	*Globicephala* sp.	Unidentified pilot whale	70	37.0085	74.3832
24-Jun-25	13:29	*Globicephala* sp.	Unidentified pilot whale	25	36.9650	74.3379
24-Jun-25	16:48	*Globicephala* sp.	Unidentified pilot whale	10	36.8626	74.4476
24-Jun-25	16:27	*Stenella frontalis*	Atlantic spotted dolphin	25	36.8630	74.4210
24-Jun-25	12:01	*Tursiops truncatus*	Bottlenose dolphin	15	36.9829	74.6294
24-Jun-25	13:19	*Tursiops truncatus*	Bottlenose dolphin	3	36.9894	74.3194
24-Jun-25	12:33	*Grampus griseus*	Risso's dolphin	9	37.0084	74.4386
24-Jun-25	13:43	*Grampus griseus*	Risso's dolphin	6	36.9492	74.3561
25-Jun-25	15:05	*Physeter macrocephalus*	Sperm whale	3	36.9547	74.4884
25-Jun-25	11:57	*Globicephala* sp.	Unidentified pilot whale	43	36.8935	74.6114
25-Jun-25	12:12	*Globicephala* sp.	Unidentified pilot whale	8	36.9067	74.4896
25-Jun-25	13:26	*Globicephala* sp.	Unidentified pilot whale	50	36.7093	74.5030
25-Jun-25	13:50	*Globicephala* sp.	Unidentified pilot whale	4	36.7975	74.5116
25-Jun-25	14:12	*Globicephala* sp.	Unidentified pilot whale	30	36.8624	74.5095
25-Jun-25	14:43	*Globicephala* sp.	Unidentified pilot whale	14	36.9398	74.4935
25-Jun-25	11:01	*Tursiops truncatus*	Bottlenose dolphin	7	36.8845	75.0938
25-Jun-25	16:26	*Tursiops truncatus*	Bottlenose dolphin	18	36.9339	74.4730
25-Jun-25	18:03	*Delphinus delphis*	Short-beaked common dolphin	18	36.9629	74.7087
14-Jul-25	11:11	*Balaenoptera physalus*	Fin whale	1	36.9079	75.0554
14-Jul-25	12:41	*Balaenoptera physalus*	Fin whale	1	36.8969	74.8655
14-Jul-25	13:46	*Balaenoptera physalus*	Fin whale	2	36.9405	74.8715
14-Jul-25	16:10	*Balaenoptera physalus*	Fin whale	1	36.8933	74.8977
14-Jul-25	18:06	*Balaenoptera physalus*	Fin whale	2	36.9299	74.9471
14-Jul-25	14:51	*Balaenoptera acutorostrata*	Minke whale	1	36.9270	74.8769
29-Jul-25	13:03	*Globicephala* sp.	Unidentified pilot whale	22	37.0422	74.6152
29-Jul-25	13:09	*Globicephala* sp.	Unidentified pilot whale	35	37.0401	74.5965

Date	Sighting Time (local)	Scientific Name	Common Name	Est. Group Size	Latitude (°N)	Longitude (°W)
29-Jul-25	13:24	*Globicephala* sp.	Unidentified pilot whale	25	37.0217	74.5112
29-Jul-25	13:34	*Globicephala* sp.	Unidentified pilot whale	45	37.0306	74.4396
29-Jul-25	13:57	*Globicephala* sp.	Unidentified pilot whale	40	36.9887	74.3661
29-Jul-25	14:24	*Globicephala* sp.	Unidentified pilot whale	20	36.9069	74.3485
29-Jul-25	14:56	*Stenella frontalis*	Atlantic spotted dolphin	40	36.7434	74.3739
29-Jul-25	16:50	*Stenella frontalis*	Atlantic spotted dolphin	4	37.0169	75.0210
29-Jul-25	15:14	*Tursiops truncatus*	Bottlenose dolphin	35	36.7601	74.4163
29-Jul-25	15:28	*Grampus griseus*	Risso's dolphin	15	36.8044	74.5005
29-Jul-25	15:53	*Grampus griseus*	Risso's dolphin	1	36.8570	74.6366
29-Jul-25	11:28	*Balaenoptera physalus*	Fin whale	9	36.9953	74.9973
28-Aug-25	13:25	*Physeter macrocephalus*	Sperm whale	5	36.5142	74.5485
28-Aug-25	17:01	*Globicephala macrorhynchus*	Short-finned pilot whale	12	36.5645	74.6225
28-Aug-25	11:59	*Stenella frontalis*	Atlantic spotted dolphin	2	36.4723	74.8248
28-Aug-25	11:33	*Tursiops truncatus*	Bottlenose dolphin	6	36.5279	74.9960
28-Aug-25	12:40	*Tursiops truncatus*	Bottlenose dolphin	2	36.4331	74.6399
28-Aug-25	12:49	*Tursiops truncatus*	Bottlenose dolphin	5	36.4349	74.6095

Key: Est. = Estimated; °N = degrees North; °W = degrees West

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B

Sea Turtle Sightings, 2024/25

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Date	Sighting Time (local)	Scientific Name	Common Name	Est. Group Size	Latitude (°N)	Longitude (°W)
10-Sep-24	12:04	*Dermochelys coriacea*	Leatherback turtle	1	36.9236	75.1652
10-Sep-24	18:26	*Dermochelys coriacea*	Leatherback turtle	1	36.7208	74.9031
10-Sep-24	18:54	*Dermochelys coriacea*	Leatherback turtle	1	36.6916	74.9839
25-Jun-25	16:39	*Dermochelys coriacea*	Leatherback turtle	1	36.9345	74.4696
10-Sep-24	18:03	*Caretta caretta*	Loggerhead turtle	1	36.7248	74.8307
10-Sep-24	18:56	*Caretta caretta*	Loggerhead turtle	1	36.6935	74.9910
10-Sep-24	20:00	*Caretta caretta*	Loggerhead turtle	1	36.6665	75.1904
10-Sep-24	21:08	*Caretta caretta*	Loggerhead turtle	1	36.7575	75.6408
25-Apr-25	19:39	*Caretta caretta*	Loggerhead turtle	1	36.9566	75.0764
7-May-25	11:20	*Caretta caretta*	Loggerhead turtle	1	36.9684	75.1217
7-May-25	20:55	*Caretta caretta*	Loggerhead turtle	1	36.8512	75.0117
7-May-25	21:05	*Caretta caretta*	Loggerhead turtle	2	36.8509	75.0913
8-May-25	21:03	*Caretta caretta*	Loggerhead turtle	1	36.8762	74.8598
11-May-25	20:16	*Caretta caretta*	Loggerhead turtle	1	36.8429	74.9595
11-May-25	20:22	*Caretta caretta*	Loggerhead turtle	1	36.8414	75.0123
25-May-25	20:25	*Caretta caretta*	Loggerhead turtle	1	36.9979	74.9629
25-May-25	20:39	*Caretta caretta*	Loggerhead turtle	3	36.9781	75.0775

Key: Est. = Estimated; °N = degrees North; °W = degrees West

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C

Photo-Identified Individuals, Deep-Diving Species, 2024/25

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HDR ID	Species	Sighting Date	Biopsy?	Satellite Tag?/Argos ID	Archival Tag?/ID
HDRVAPm150	*Physeter macrocephalus*	23-Feb-25	No	No	No
HDRVAPm150	*Physeter macrocephalus*	24-Feb-25	No	No	No
HDRVAPm151	*Physeter macrocephalus*	24-Feb-25	No	No	No
HDRVAPm152	*Physeter macrocephalus*	24-Feb-25	No	No	No
HDRVAPm153	*Physeter macrocephalus*	07-May-25	Yes	SPLASH10/229396	No
HDRVAPm154	*Physeter macrocephalus*	07-May-25	No	No	CATS/002
HDRVAPm155	*Physeter macrocephalus*	07-May-25	No	No	CATS/002
HDRVAPm156	*Physeter macrocephalus*	07-May-25	No	No	DTAG/338
HDRVAPm157	*Physeter macrocephalus*	07-May-25	No	No	No
HDRVAPm158	*Physeter macrocephalus*	08-May-25	No	No	No
HDRVAPm159	*Physeter macrocephalus*	08-May-25	No	No	No
HDRVAPm160	*Physeter macrocephalus*	08-May-25	No	No	No
HDRVAPm161	*Physeter macrocephalus*	08-May-25	No	No	No
HDRVAPm162	*Physeter macrocephalus*	08-May-25	No	No	No
HDRVAPm163	*Physeter macrocephalus*	08-May-25	No	No	No
HDRVAPm023	*Physeter macrocephalus*	11-May-25	Yes	SPLASH10/233707	No
HDRVAPm116	*Physeter macrocephalus*	11-May-25	Yes	SPLASH10/229397	No
HDRVAPm123	*Physeter macrocephalus*	11-May-25	No	No	CATS/003
HDRVAPm125	*Physeter macrocephalus*	11-May-25	No	No	No
HDRVAPm164	*Physeter macrocephalus*	11-May-25	No	No	No
HDRVAPm165	*Physeter macrocephalus*	11-May-25	No	No	No
HDRVAPm166	*Physeter macrocephalus*	25-May-25	Yes	SPLASH10/229398	No
HDRVAPm167	*Physeter macrocephalus*	25-May-25	No	No	No
HDRVAPm168	*Physeter macrocephalus*	03-Jun-25	No	No	DTAG/338
HDRVAPm169	*Physeter macrocephalus*	03-Jun-25	No	No	CATS/002
HDRVAPm170	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm171	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm172	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm173	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm174	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm175	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm176	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm177	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm178	*Physeter macrocephalus*	03-Jun-25	No	No	No
HDRVAPm179	*Physeter macrocephalus*	04-Jun-25	No	No	No
HDRVAPm180	*Physeter macrocephalus*	04-Jun-25	No	No	No
HDRVAPm181	*Physeter macrocephalus*	24-Jun-25	No	No	CATS/002
HDRVAPm182	*Physeter macrocephalus*	24-Jun-25	No	No	No
HDRVAPm183	*Physeter macrocephalus*	24-Jun-25	No	No	No
HDRVAPm184	*Physeter macrocephalus*	24-Jun-25	No	SPLASH 10F/229399	No
HDRVAPm185	*Physeter macrocephalus*	25-Jun-25	No	No	No

HDR ID	Species	Sighting Date	Biopsy?	Satellite Tag?/Argos ID	Archival Tag?/ID
HDRVAPm186	*Physeter macrocephalus*	25-Jun-25	No	No	No
HDRVAPm187	*Physeter macrocephalus*	25-Jun-25	No	No	No
HDRVAPm023	*Physeter macrocephalus*	28-Aug-25	No	No	No
HDRVAPm116	*Physeter macrocephalus*	28-Aug-25	No	No	No
HDRVAPm123	*Physeter macrocephalus*	28-Aug-25	No	No	No
HDRVAPm164	*Physeter macrocephalus*	28-Aug-25	No	No	No
HDRVAPm188	*Physeter macrocephalus*	28-Aug-25	No	No	No
HDRVAPm189	*Physeter macrocephalus*	28-Aug-25	No	No	No

Key: CATS = Customized Animal Tracking Solutions; DTAG = digital acoustic recording tag; ID = Identification Number