Final

Sea Turtle Tagging and Tracking in Chesapeake Bay and Coastal Waters of Virginia 2014 Annual Progress Report

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Prepared by:

Susan G. Barco & Gwen G. Lockhart

Virginia Aquarium & Marine Science Center Foundation

Submitted by:

Virginia Beach, VA

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Capturing a sea turtle. Photo taken by Virginia Aquarium & Marine Science Center Foundation NMFS Permit 16134.

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Acronyms and Abbreviations

ACT	Atlantic Cooperative Telemetry
°C	degrees Celsius
CI	confidence interval
DPS	distinct population segment
ESA	Endangered Species Act
EST	Eastern Standard Time
GI	gastrointestinal
GPS	Global Positioning System
HR	home-range
JEB	Joint Expeditionary Base
kg	kilogram(s)
LC	Joint Expeditionary Base Little Creek
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NMFS	National Marine Fisheries Service
NNB	Norfolk Naval Base
OBIS-SEAMAP	Ocean Biogeographic Information System-Spatial Ecological Analysis of Megavertebrate Populations
PIT	Passive Integrated Transponder
PTT	Platform Transmitter Terminal
SCL-NT	Straight Carapace Length – notch to tip
SMRU	Sea Mammal Research Unit
SRDL	Satellite Relay Data Logger
SSM	state-space model
STAT	Satellite Tracking and Analysis Tool
TEWG	Turtle Expert Working Group
USFWS	U.S. Fish & Wildlife Service
UTC	Coordinated Universal Time
VAQF	Virginia Aquarium Foundation

1. Background and Introduction

Five species of sea turtles occur in the Chesapeake Bay and the coastal waters of Virginia and Maryland with varying regularity. They include the loggerhead sea turtle (*Caretta caretta*), Kemp's ridley sea turtle (*Lepidochelys kempii*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), and hawksbill sea turtle (*Eretmochelys imbricata*). Loggerhead and Kemp's ridley turtles are the most abundant and regularly occurring species in Virginia (Swingle *et al*. 2010, 2011, 2012, 2013, 2014). Although green turtles and leatherbacks are observed annually, they are unevenly distributed and far less abundant in the region (Swingle *et al*. 2010, 2011, 2012, 2013, 2014). The hawksbill turtle is the rarest, with only two records in Virginia (Keinath et al. 1991). Cheloniid, or hard-shell, sea turtles in Virginia are migratory appearing in the region in the late spring when water temperatures rise to approximately 20°C and leaving in the fall when water temperatures decrease (Mansfield et al. 2009).

The majority of stranded sea turtles in Virginia are juvenile loggerheads. From 2009 to 2013 the average size of non-hatchling loggerheads is69.6 cm (±12.3SD) straight carapace length notch to tip (SCL-NT) with a ranging of 46 to 107 cm SCL-NT (Swingle et al. 2010, 2011, 2012, 2013, 2014). The first loggerhead strandings usually occur in the beginning half of May but moderately decomposed loggerheads have stranded as early as the end of April. Stranded Kemp's ridley turtles are also predominantly juveniles ranging from 17.7 to 64.9 cm SCL-NT with a mean of 35.0 cm (±9.4SD) from 2009 to 2013. Kemp's ridleys usually first appear in the stranding record in the second half of May but have stranded in the second week of May. Stranded green turtles are almost exclusively juveniles with only one adult turtle in the stranding record in the past twenty years (VAQ unpublished data). From 2009 to 2013, stranded green turtles ranged in size from 20.3 to 34.0 cm SCL-NT with a mean of 28.4 cm (±3.0SD). Green turtles tend to enter the stranding record later in the year than loggerheads and Kemp's ridleys with the first strandings usually occurring in July, but there is one record in recent years of a live green turtle being picked up in the third week of June. From 2009 to 2013, leatherback sea turtles stranded in all months from May through October but were relatively uncommon in the stranding record with 18 strandings during that time period. During this time frame, a third of the leatherback strandings occurred in June (N=6). Length measurements exist for only eight leatherbacks due to several of the animals being live entanglements or mangled by vessel strikes. The mean SCL-NT was 146.9cm (±6.7SD) and the range was 135.5 to 168cm.

In the past ten years, strandings of both Kemp's ridley and green turtles have been increasing while loggerhead numbers have been relatively flat (Swingle et al. 2014). All three species have nested in Virginia but only loggerheads have nested annually with an average of less than ten nests per year in the past ten years (Ruth Boettcher, Virginia Department of Game and Inland Fisheries, pers. comm.). For all three species, the stranding record includes more female than male turtles, with 61% of the turtles with the sex determined as being female and 39% as being male. More general species information can be found in the Federal recovery plans (National Marine Fisheries Service [NMFS] and U.S. Fish & Wildlife Service [USFWS] 1991a, 1991b, 1993, 2008; NMFS et al. 2010).

The ultimate goal of this study is to provide the US NAVY with the necessary data to help identify seasonal areas where cheloniid sea turtles are likely to occur in order to inform DOD sea turtle protection efforts. This project focuses on the three cheloniid sea turtle species commonly seen in Virginia, which are the loggerhead sea turtle, Kemp's ridley sea turtle, and green sea turtle (Hager 2014). There are three aspects of this project. First, we are characterizing broad-scaled movement patterns using satellite telemetry. Second, we are characterizing turtle presence in various military zones (**Figure 1**) using the both satellite and acoustic data. Third, we are comparing location among the three sets of data generated by the tags: detection data from acoustic tags, Argos location data from satellite transmitters and GPS location data from GPS equipped satellite transmitters.

Final deliverables will include the following:

- Raw and filtered satellite telemetry GPS and ARGOS location data from all turtles tracked by VAQF from 2007-2015 (n~60).
- Dive and temperature data reported from US Navy satellite tags that have pressure and temperature sensor capability.
- Monthly cumulative foraging and migration utilization distribution grids that are created from state-space modeling results. The grids will report the relative probability that tracked turtles will exhibit migration or foraging behavior within defined locations in each month of the year.
- Raw and summarized acoustic telemetry data compiled from US NAVY and other receivers throughout the range of all tagged turtles.
- Final report summarizing the methods and results from all aspects of the study.
- All digital spatial and tablature data used in report analysis.

2. Methods

2.1 Access to Turtles

Turtles for this project were accessed in three ways: direct capture, incidental capture, and rehabilitated and released animals. Turtles acquired via capture or incidental capture were taken under the authority of NMFS Research permit 16134. Researchers used two methods in attempts to capture turtles, dip netting and tangle netting. The dip-net technique was used in the late spring and early summer in the ocean, and the tangle net was deployed in the summer and fall in the Chesapeake Bay. For dip netting, a larger vessel was used as an observation platform to sight turtles resting at the surface. Once a turtle was sighted, a smaller vessel was deployed to approach and net the turtle using a large dip net. For tangle netting, a larger vessel was used as a processing platform and a net was deployed and checked from a smaller vessel. A third vessel was used to approach bottlenose dolphin groups and discourage them from approaching the net. Dolphins were harassed under NMFS General Authorization 17235. The 183-meter, 30-centimeter mesh, nylon twine net was anchored in shallow water for several hours surrounding a slack tide. Bullet buoys with short monofilament tethers were attached to the float line of the

net every 2–3 meters. The net was continually scanned for movement of the bullet buoys. If the buoys showed signs of erratic movement, the net was hauled up and checked at that location. Otherwise, the entire net was checked every 20–30 minutes.

Incidentally captured turtles could be acquired in one of two ways: captured incidental to commercial pound net (fish trap) operations or caught in trawl operations in conjunction with dredging. We worked with two pound-net fishermen on the eastern shore of Virginia in order to gain access to incidentally caught turtles. After three mortalities in 2013, we stopped allowing fishers to boat turtles and asked them to wait at the net until we could retrieve turtles directly from the nets. This placed an added burden on the fishers, and we agreed to offset the additional time spent waiting at the net until our arrival by compensating the fishers for their time. Regardless, we did not receive any calls from fishers reporting turtle takes to us in 2014. In 2014, dredge operations associated with maintaining shipping channels in Chesapeake Bay and beach replenishment in southern Virginia Beach were underway during sea turtle season. After documenting takes, the dredge was required to have a trawler in place in front of the dredge head. We worked with observers operating the trawl to coordinate transfer of any captured turtles for tagging. The trawl operated for fourteen days and was then cancelled due to lack of captures.

Turtles that had been rehabilitated and released were also affixed with tags under the blanket USFWS permit to NMFS. This included turtles that stranded in Virginia and were rehabilitated at the Virginia Aquarium & Marine Science Center in 2013 and 2014, turtles that were transferred to the National Aquarium from Virginia, and turtles that did not strand in Virginia and were rehabilitated by the National Aquarium.

2.2 Tagging and Health Assessment

All turtles captured by dip net, tangle net, or in pound nets were assessed to determine their general state of health and suitability for research procedures. In the case of rehabilitated animals, the Virginia Aquarium contract veterinarian certified that each turtle was ready to be released into the wild and any tags placed on rehabilitated turtles were suitable for the weight of the individual.

Morphometric measurements, photographs, and health-assessment samples were collected for all rehabilitated and captured turtles tagged as part of this project. Curved and straight measurements, as well as weights were collected from all turtles. Photographs were taken from dorsal, ventral, lateral, and head-on views. Images of appendages, wounds, and abnormalities were also collected. We collected blood for health-assessment and stable-isotope analysis, a tissue sample for genetics and stable-isotope analysis, and unusual epibiota when present. All samples were sent to appropriate labs for analysis. Results will be compiled and reported in the final report submitted in 2015. Internal temperature, heart rate, and respiration rate were logged for all wild-caught turtles. Inconel® alloy flipper tags and BIOMARK® Passive Integrated Transponder (PIT) tags were applied to all turtles larger than 30-cm straight carapace length that did not have existing tags. All PIT and flipper-tag identification numbers were sent to Peter J. Eliazar at the Archie Carr Center for Sea Turtle Research at the University of Florida, Department of Biology, who maintains the national sea turtle tagging database.

Tag types

Both satellite and acoustic telemetry were used in the study. We used the following three satellite tag models: 1) Sea Mammal Research Unit (SMRU) Satellite Relay Data Logger (SRDL) tags with GPS *Fastrac* technology allowing the tag to transmit not only ARGOS locations but also much more accurate GPS locations, ARGOS transmitter, time-depth-recorder, and ambient temperature sensor; 2) Wildlife Computers SPLASH tags with ARGOS transmitter, pressure sensor, and ambient temperature sensor; and 3) Wildlife Computers SPOT tags with ARGOS transmitter and ambient temperature sensor. We deployed SMRU tags on turtles that weighed more than 30 kilograms (kg), while the Wildlife Computer tags were deployed on smaller turtles weighing between 7 and 30 kg. SMRU tags were programed during manufacturing, and Wildlife Computer tags were programed by Virginia Aquarium Foundation (VAQF) personnel prior to deployment. All satellite tag models were programed to collect continuous location and sensor data. Wildlife Computer SPLASH tags were programed to record the percent of time that turtles spent in ambient water temperature intervals (8; 10; 12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32; >32 degrees Celsius) and depth intervals (1; 2; 3; 4; 5; 10; 20; 30; 40; 50; 100; 150; 200; >200 meters) during 6 hour intervals. SMRU SRDL tags were programed to collect the dive profiles and transmit the locations and times of each dive's start and end points, depths and times of recorded depth, dive durations, and time at temperature and depth histograms programed the same as the SLASH tag intervals. Wildlife Computer SPOT tags do not have a pressure sensor, therefore no dive information was collected. SPOT tags do have an ambient water temperature sensor and were programed to record the percent of time that turtles spent in temperature intervals (12; 14; 16; 18; 20; 22; 24; 26; 28; 30; 32 degrees Celsius) during 6 hour intervals.

We deployed several models of Vemco acoustic coded transmitters (V9-2x, V13-1x, V16-4x, V16-5x). Signals from acoustic transmitters on turtles were recorded by Vemco acoustic receivers maintained by the U.S. Navy and other members of the Atlantic Cooperative Telemetry (ACT) Network. Data were compiled by both the Naval Facilities Engineering Command (NAVFAC) in Norfolk, Virginia and by VAQF. Compiled records were stored in a VAQF Microsoft® Access® database.

Prior to tag attachment, the carapace of each turtle was prepared by removing epibiota and dead scute tissue with putty knives and coarse (60-100) grit sandpaper. After sanding, the scutes were wiped clean and washed with acetone. We used Sika Anchorfix-1™ epoxy for all tag attachments. For turtles that received both a satellite tag and an acoustic tag, we set the satellite tag on the second vertebral scute and the acoustic tag was adhered caudal to the satellite tag in the same epoxy footprint set at an angle of approximately 35 degrees. The epoxy covered two-thirds of the acoustic tag. The epoxy was used to create a teardrop-shaped footprint with the broad, rounded part of the teardrop facing cranially and the narrow, pointed part of the teardrop facing caudally. For turtles that only received an acoustic tag, the tag was affixed to the caudal-most vertebral scute. For the smaller turtles, we attempted to limit the epoxy footprint to the one scute to allow for growth.

Satellite Telemetry Data Collection and Analysis

Given that tag data are still being collected, we will not report our final analysis now. However, we will report the general methods to be used in our final analysis and metrics calculated from the current satellite telemetry dataset.

Platform Transmitter Terminal (PTT) data were published via the seaturtle.org Satellite Tracking and Analysis Tool (STAT) (http://www.seaturtle.org/tracking/?project_id=917&dyn=1423751140) and on the Ocean Biogeographic Information System-Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP), Virginia Aquarium and U.S. Navy Sea Turtle Research Project (http://seamap.env.duke.edu/dataset/1018). A collaborative Movebank.org study was created, and a live feed was set up that automatically decoded and stored all ARGOS and GPS locations. VAQF historical tag data were manually imported into the Movebank study to be used with data collected from tags funded under the U.S. Navy project. We combined GPS and ARGOS locations to leverage the precision of the GPS data and quantity of the ARGOS data. Proxy ARGOS attributes were added to the GPS data in order to identify spatial outliers with the Douglas ARGOS Filter Algorithm (version 8.50) using the parameters suggested by the Turtle Expert Working Group (Douglas et al. 2012, TEWG 2009). We then added a bathymetry attribute to the filtered location data by extrapolating the grid values from the ETOPO1 Global Relief Model and removed any location that had an elevation greater than 0.5 meters and less than -2,000 meters (Amante et al. 2009). Additionally, points were removed that were visually deemed to be implausible by creating a trackline using the date/time field to connect the points. Occasionally a tag would not transmit data for more than seven days and then begin transmitting again. For analysis, we considered all points separated by seven or more days to be a separate deployment to account for breaks in date/time fields.

Two datasets (A and B) are being produced that will be used in the final analysis. To create Dataset A, we are using the Douglas Argos Filter Algorithm to select the best point per day (turtle day) for each PTT. Dataset A will be used in any un-interpolated analysis to remove spatial autocorrelation bias. Dataset B is being developed by Andrew DiMatteo, from NAVFAC, who is interpolating all points not identified as outliers into 6-hour intervals. Dataset B will be used to characterize each location as foraging or migratory behavior using a switching state-space model (SSM) described by Jonsen et al. (2007). The final interpolated data set will be segmented into months and behavior state (migrating and foraging) and inputted into a cumulative home-range (HR) model described by Lockhart and Barco (2014). HR analysis reports animal occurrence; however, it does not infer animal behavior. The SSM can be used to model population time-series data and identify behavior state based on telemetry data (Jonsen et al. 2003; Newman et al. 2006). By combining SSM and HR analysis, we can report the home range for each animal's foraging and migration locations in each month of the year. Using the cumulative HR approach, we will intersect the home ranges in order to quantify the intensity of seasonal habitat use. This method will allow us to use our current and historical data to create monthly foraging and migration grids that show areas with a high relative probability of tracked turtles engaging in foraging or migrating behavior.

Comparison of acoustic and satellite tag data

Although we conducted a preliminary analysis of acoustic and Argos location data in 2014, we have decided to conduct the final analyses after all turtles with both satellite and acoustic tags have stopped transmitting. Currently we have one double tagged turtle that is still transmitting. In addition, we will be conducting a ranging test on the acoustic tags in the spring/early summer of 2015 to better estimate the distance from a receiver.

3. Results

For the length of the project, we have conducted four dip-net trips (effort=196 km) and six tangle-net trips (effort=20 hours) in 2013 and 2014 (**Figure 2**). We captured one loggerhead turtle using the dip-net technique and one Kemp's ridley turtle using the tangle-net technique. In 2013, three loggerhead turtles were incidentally captured in pound nets; however, in 2014, no turtles were incidentally captured in pound nets or the dredge trawl. In addition to the captured and incidentally caught animals, we deployed tags on an additional 33 animals (4 green turtles, 16 Kemp's ridley turtles, and 14 loggerhead turtles) that were rehabilitated and released (**Figure 3**). Two of the Kemp's ridley turtles released in 2014 were found dead less than a week after release. They were both too decomposed to determine the cause of death. Neither turtle had its acoustic tag attached at the time of stranding. A third Kemp's ridley turtle (VAQS20142128) was released after a brief rehabilitation from being hooked by a recreational fisher and was hooked again at a different pier 5 days after release. The turtle swallowed the second hook and was treated for 40 days prior to release a second time. Upon retrieval from the pier when it was hooked the second time, the turtle was knocked briefly against a piling and its tag fell off. The tag was retrieved and redeployed when the turtle was released the second time.

For the project, we have deployed 38 acoustic tags and 14 satellite tags (**Tables 1 and 2, Appendix C**. We deployed a Wildlife Computers SPLASH tag and a Vemco V13-1x tag on the loggerhead turtle captured in the dip net. No electronic tags were deployed on the Kemp's ridley turtle captured using the dip net, because of its small size and healed flipper amputation. All incidentally caught turtles were deployed with two tags—one turtle received a V16-1x acoustic tag and a SMRU satellite tag and the other three received V16-1x acoustic tags and satellite tags not purchased under U.S. Navy funding. The other 12 satellite tags were deployed on rehabilitated turtles (3 Kemp's ridleys and 9 loggerheads). The other 34 acoustic tags were also deployed on rehabilitated turtles (4 greens, 17 Kemp's ridleys, and 13 loggerheads). Of the 14 turtles released with U.S. Navy-funded satellite tags, one is still transmitting. We currently have one 9000x-SRDL tag, one SPLASH-284A, one SPOT-5, and two Vemco tags left to deploy in 2015. A total of 20 animals were released with both satellite and acoustic tags, and six of these were deployed with U.S. Navy-funded satellite tags. As part of our historical tag analyses, we provided the U.S. Navy with data from an additional 43 satellite tags, including the 12 satellite tags that were dual-deployed during this project.

3.1 Acoustic Tagging Results

Number of deployments and detections

Twenty-seven of the 38 acoustic tags (71 percent) were detected by an array. Twenty-five turtles (66 percent) were detected by the Navy array. Tags were detected by arrays in Maryland, South Carolina, and Florida in addition to two non-U.S. Navy arrays in Virginia (**Table 3, Appendix B**). Two sea turtles tagged in North Carolina by researchers at the NMFS Beaufort Laboratory were also detected on the U.S. Navy array. Loggerheads had longer maximum and mean days detected post-release, as well as higher number of detections and number of different days detected than green or Kemp's ridley turtles (**Table 3**). There were 4,287 sea turtle detections, 4,196 of which were from U.S. Navy receivers. Detections on the U.S. Navy array were highest in October of each year (**Table 4**) followed by July–September of 2014. Using number of tags deployed up to 60 days prior to the last day of the month as a measure of effort, tags deployed was not significantly correlated with total number of detections (Pearson's product-moment correlation test: t=1.658, p=0.066, r=0.48) but was significantly positively correlated with number of turtles detected (Pearson's product-moment correlation test: t=2.494, p=0.017, r=0.64).

Location of detections

Turtles were detected on 40 of the 62 U.S. Navy receivers in the lower Chesapeake Bay, including the James River, one station in the Elizabeth River, and the Atlantic Ocean. Turtles were detected in all military zones (**Tables 5-9**). In addition, one green turtle was detected on six of the nine receivers in the York River (**Table 10**). No turtles were detected in the Chickahominy or Pamunkey rivers. Detection levels were relatively low, less than 300 detections, for the zones associated with Naval Weapons Station Yorktown/Cheatham Annex, Joint Expeditionary Base (JEB)-Fort Story and the Firing Range Surrogate zone for NAS Oceana Dam Neck Annex, as well as for receivers in Chesapeake Bay not associated with a military zone. Detections were considerably higher for the Norfolk Naval Base (NNB) and JEB-Little Creek zones (LC) with 2,505 and 1,745 detections, respectively. The highest detections in these two zones were in October (NNB-1,067; LC=759), but NNB also had high detections in July (n=528) and August (n=592) and LC had high detections in September (n=715).

Of the 49 Navy receivers that detected turtles, 25 detected only one turtle (**Table 11**). Two receivers, one in the LC Zone and one in the NNB Zone, detected nine different turtles. Nine receivers detected all three species, and nine other receivers detected two species. Of the seven receivers that detected five or more turtles, four were in the NNB Zone, one was in the LC Zone, and one was in the Atlantic Ocean off Rudee Inlet.

The four green turtles were released in July 2013 (n=2), June 2014 (n=1), and August 2014 (n=1) and green turtles were detected in all military zones except JEB-Fort Story (**Figure 4**). Most of the detections in the military zones occurred from June to September 2014. The green turtle released in June 2014 traveled into the York River (Naval Weapons Station Yorktown zone) in July and August of 2014. NNB detections were in June and August 2014, and JEB-Little Creek detections were in September and October 2014. Detections in the Firing Range Surrogate zone occurred in July 2013, August 2014, and October 2014.

Kemp's ridley turtles were released in August (*n*=1) and September (*n*=1) of 2013 and May (*n*=1), June (*n*=7), July (*n*=3), August (*n*=2), September (*n*=1) and October (*n*=1) of 2014, and Kemp's ridley turtles were detected in all of the lower Chesapeake Bay and the Atlantic Ocean military zones (**Figure 5**). The highest numbers of detections were in the NNB zone in September 2013 and June, July, September and October 2014. Fewer Kemp's ridley turtle detections occurred in the other military zones. LC detections were in July and September 2014. Detections in the JEB-Fort Story zone most likely were associated with a beach release location in First Landing State Park. Detections in the Firing Range Surrogate zone occurred from June to September 2014 and may have been associated with boat releases in the ocean waters off Virginia Beach.

Loggerhead turtles were tagged in August (*n*=1), September (*n*=5), October (*n*=4), and November (*n*=1) of 2013 and in June (*n*=4), July (*n*=1), September (*n*=1), and October (*n*=1) of 2014. Loggerheads were detected in all of the lower Chesapeake Bay and the Atlantic Ocean military zones (**Figure 6**). The NNB and the LC zones had higher numbers of detections than the JEB-Fort Story and the Firing Range Surrogate zones. NNB zone detections occurred in September and October of 2013 and July and August of 2014. LC detections were in August, September, and October of 2013 and June, August, September, and October of 2014. Detections in the JEB-Fort Story zone occurred in September 2013 and May and June 2014, and detections in the Firing Range Surrogate zone occurred in September, October, and November of 2013 and June and September of 2014.

We converted the time of detection from UTC to EST and compared the times of detections in the NNB and LC zones. Detections in NNB were more prevalent in the morning (from 0800 to 1000), and in LC were more prevalent in the evening and early morning (with peaks from 2000 to 0000 and 0200 to 0600) (**Figure 7**).

Movement patterns

We arbitrarily identified turtles with high detection rates as those that were detected more than 200 times and on 10 or more days (see **Appendix B**). Three were loggerhead turtles, one was a green turtle, and one was a Kemp's ridley turtle. An additional loggerhead turtle was the only turtle to have been detected in both years. An additional green turtle, detected 196 times, was the only turtle to be detected in the York River and was detected on 17 different days, more than any other turtle. Detection patterns for each of these turtles will be discussed individually. For these detailed patterns of appearance, the array was divided into regional zones, including five military zones, Chesapeake Bay (not in a military zone), and the York River (not in a military zone). Duration in a zone was defined as the time from first to last detection with no more than 60 minutes between detections. For the duration calculations, a single detection in a zone was calculated as a 5-minute duration.

VAQS20142111 was a loggerhead turtle hooked by a recreational fisherman on 17 June 2014, and was rehabilitated and released from a vessel in the ocean off Virginia Beach on 2 July 2014. It was detected the next day near the Chesapeake Bay Bridge Tunnel, and nine days later, on 12 July, it was detected in the NNB zone, where, for seven of the next 30 days through 11 August, it was detected for durations ranging from 0.08 to 14.1 hours (**Figure 8**). On the 24 days it was not detected in the NNB zone, it was not detected on any other receivers,

suggesting that it either moved up the James River or north of Hampton Roads into the middle Chesapeake Bay. Eight days after its last detection in the NNB zone, it was detected in the LC zone for nearly 3.9 hours on 19 August. Then, 13 days later, it was sighted for 6 of the next 12 days in the LC zone, for durations of up to 14.4 hours. It was not detected for 15 days, then again detected in LC for 7 of the next 13 days including a six day stretch from 5 to 9 October. It was not detected in any other zones when not in the LC zone. Its last detection occurred on 10 October, in the Chesapeake Bay zone. During the 100 days from release to last detection, VAQS20142111 was detected 1,519 times for a total of 129.8 hours in the vicinity of U.S. Navy receivers, and 114.9 hours (88.5 percent) were spent in a military zone, which was approximately 4.69 percent of the time from 2 July to 10 October. Since the receivers do not cover the entire areas associated with the Navy facilities, this should be considered a minimum time estimate. Based on telemetry data from other loggerhead turtles, the last detection was near the time the turtle would be expected to leave the region and move south.

VAQR20132015 was a loggerhead turtle found in the fish trap of a pound net by a cooperating fisher on 7 September 2013, and it was tagged and released the same day from the Eastern Shore of Virginia near Fisherman Island. The turtle was detected 826 times on 13 different days, and was last detected 53 days post-release (**Figure 9**). The turtle was outfitted with a satellite tag that transmitted for 347 days. VAQR20132015 was first detected on the U.S. Navy array 28 days following release on 5 October. It was detected in the JEB-Little Creek zone for 2 days. Then a day later it was detected in the NNB zone, where it spent parts of 9 of the next 21 days. When not detected in the NNB zone, the turtle was not detected in any other zone. Two days after its last detection in the NNB zone, the turtle was detected in the JEB-Little Creek zone, and the next day it was last detected in the Firing Range Surrogate zone on 31 October, suggesting that it was leaving the area. Satellite telemetry data showed that for the first 28 days following release, the turtle was in the Atlantic Ocean north of Chesapeake Bay and it left Virginia in early November 2013. In the spring of 2014, it briefly returned to Virginia ocean waters in May before heading north. It was not detected on the U.S. Navy array during that time (**Figure 10**).

Loggerhead turtle VAQS20132106 was hooked by a recreational fisher at a pier in Norfolk, Virginia, on 3 August 2013, and was released into the Chesapeake Bay on 28 September 2013. It was detected 393 times on 10 different days and was last detected 29 days post-release. It was outfitted with a satellite tag which transmitted for 346 days. It was detected in the LC zone 2 days following release and was detected in that zone for 7 of the next 26 days (**Figure 11**). It was not detected in any other zone during that time. The last detection in the LC zone was on 26 October. It was detected in the Firing Range Surrogate zone the next day, and was not detected again. Satellite telemetry indicated that VAQS20132106 returned to Chesapeake Bay and was in the vicinity of the LC zone from 20 May 20 2014, until the satellite tag stopped transmitting on 5 July 2014 (**Figure 12**). The acoustic tag was attached to the turtle within the same epoxy footprint as the satellite tag, and the satellite transmitted from the LC zone in 2014, although the turtle was not detected on the U.S. Navy array, suggesting acoustic tag fouling or failure.

The final high-use loggerhead turtle was VAQS20132102, which was an animal hooked from a recreational fishing pier on 30 July 2013, and released from the southeastern oceanfront in Virginia Beach on 20 October 2013. It was detected in the JEB-Fort Story zone 3 days after

release and the next day in the LC zone near where it had been hooked in July (**Figure 13**). On 31 October, it was detected in the Chesapeake Bay and was not detected again in 2013. On 26 May 2014 it was detected in the JEB-Fort Story zone as it entered Virginia and was detected in the Chesapeake Bay, LC, JEB-Fort Story, and Firing Range Surrogate zones until 6 June. The satellite track suggests that the turtle left Virginia waters in early November, and the satellite tag stopped transmitting on 25 April 2014, while the turtle was off the coast of North Carolina (**Figure 14**).

The only Kemp's ridley turtle (VAQS20142152) to be detected more than 200 times was hooked by a recreational fisher on 23 July 2014 at a pier in Hampton, Virginia. It was released from the Virginia Beach oceanfront on 2 September 2014. It was detected in the LC zone on 3 September 2014 and then the NNB zone with no more than 2 days absence until the last detection on 17 October 2014 (**Figure 15**).

Green turtle VAQS20142138 was hooked by a recreational fisher in Rudee Inlet on 5 July 2014, and was released on 18 August 2014. It was detected 631 times on 12 different days up to 63 days post-release. This green turtle was first detected 3 days after release in the Firing Range Surrogate zone and 10 days later in the LC zone (**Figure 16**). It was detected on 11 of the next 34 days in the LC zone and was not detected in any other zone during that period. Two weeks after the last detection in the LC zone on 4 October, the turtle was detected in the Firing Range Surrogate zone on 19 October 19.

The final green turtle (VAQS20132220), released on 22 June 2014, was detected 196 times on 17 different days up to 96 days post-release and was the only high-use turtle to have been detected by a non-U.S. Navy receiver. It was first detected 2 days after release in the NNB zone and then twice on 28 July 2014—at a pier at Gloucester Point and later in the day in the Naval Weapons Station zone (**Figure 17**). For the next 7 days, it was detected in the Naval Weapons Station zone and adjacent to the zone in the York River. On 3 August 2014, it was detected in the Naval Weapons Station zone and later at the Virginia Institute of Marine Science pier. Seven days later it was detected in the NNB zone for 6 of the next 7 days. Forty-one days later it was detected in the Firing Range Surrogate zone on 26 September 2014.

Of the seven movement patterns of highly detected turtles, five were last detected for 1 day in the Atlantic Ocean (Firing Range Surrogate zone) after having been in Chesapeake Bay, suggesting the beginning of the fall migration. The other two turtles were detected moving toward the bay mouth in the fall. One of these was also detected entering the bay in the spring. These data precisely detect movements of sea turtles in and out of Chesapeake Bay.

In addition to the detections on the U.S. Navy array, five turtles were detected on non-U.S. Navy arrays, and three of these were not detected on the U.S. Navy array (see **Appendix B**). Two of the non-U.S. Navy arrays that detected turtles, which we tagged, were in Virginia, and the other three were in Maryland, South Carolina, and Florida. The South Carolina array in the ocean near Charleston was operated by the South Carolina Department of Natural Resources. Of the three turtles not detected on the U.S. Navy array, two were loggerheads and one was a Kemp's ridley. The Kemp's ridley was released in the Maryland portion of Chesapeake Bay on 21 June 2014, and was detected on a mobile receiver operated by the Smithsonian Environmental Research Center and the Ocean Research Project in the Maryland Bay on 6 September 2014.

A loggerhead (VAQS20132086) caught on hook and line by a recreational fisher in July of 2013 was released from Virginia Beach on 20 October 2013, and was detected 15 times by two receivers off Charleston, South Carolina, on 1 May 2014. This turtle was found dead on the Outer Banks of North Carolina on 8 November 2014, with wounds consistent with vessel strike and a hook in the GI tract. The carcass did not have a tag attached, and the scutes where the tags had been attached appeared to be normal. The other loggerhead (NAIB 1240CC) was also released on 20 October 2013, and was detected 28 times on four receivers off Cape Canaveral, Florida, on 25 and 26 March 2014.

3.2 Satellite-Telemetry Tagging Results

Data collection and processing

As of 1 January 2015, the movebank.org study included data from 53 turtles (10,510 GPS records and 110,428 Argos location records) from satellite-tagged turtles. Dataset A (the turtle day data) included 1,422 days from 37 deployments (**Figure 18**). Preliminary regional analysis shows that the areas with the most turtle days, number of 24 hour periods in which a turtle's tag transmitted, were the York River, the mid-Chesapeake Bay off Church Neck, the waters just east of the Hampton Roads Bridge Tunnel, waters off the Virginia Beach Oceanfront, and the ocean waters outside of Chincoteague Inlet (**Figure 19**). The only area that had greater sea turtle occurrence (61–70 days) was off Oregon Inlet, North Carolina.

Dataset B was filtered and sent to Andrew DiMatteo for analysis. Before interpolation, Dataset B included 8,603 GPS records and 48,217 Argos records from 42 turtles. Andrew DiMatteo created interpolated tracks for eight turtles and identified 1,086 locations as migratory and 6,369 locations foraging. These data will be used to create grids showing relative probability of foraging and migrating for each month of the year.

4. Discussion

4.1 Acoustic Telemetry Data

Ten of the 38 tagged turtles were not detected on any array. Of these, two were released in the fall of 2013 and either did not return to Virginia or lost their tags before returning to the area, and two were released in the fall of 2014 and hopefully will be detected in the spring of 2015. Two turtles that were not detected, one green and one Kemp's ridley, were found dead within a week of being tagged. Two Kemp's ridley turtles released by the National Aquarium in the Maryland portion of Chesapeake Bay were not detected. One Kemp's ridley and one loggerhead turtle released in June of 2014 were also not detected. The Kemp's ridley turtle was released from shore near the mouth of Chesapeake Bay and the loggerhead turtle was released from a vessel in the Atlantic Ocean off Virginia Beach.

Nine of the 28 turtles that were detected had greater than 200 detections on up to 27 different days. Five loggerheads were detected 100 or more days post-release and one green turtle was detected 96 days post-release, and one Kemp's ridley was detected 76 days post-release. Detection patterns for green turtles appeared to be heavily influenced by the release dates of the turtles; however, more green turtles need to be tagged to better understand patterns of

appearance in military zones. The difference in the numbers of detections of Kemp's ridleys between the NNB zone and other zones suggests that the area surrounding NNB may be a foraging area for Kemp's ridley turtles, while they may have been transiting through the other zones. The difference in the numbers of loggerhead detections in the NNB and LC zones compared with the other zones suggests that loggerhead turtles may be foraging in the NNB and LC zones and may only have been transiting through the other zones.

Of the seven turtles known to be dead, three were outfitted with only an acoustic tag and were recovered within 10 days of release. Although they were recovered as moderately decomposed carcasses, none were recovered with their tag. We are concerned that the epoxy attachment method may not be the best attachment method for small, juvenile turtles. A wire attachment method, deployed in 2015, may result in longer tag attachment. Satellite Telemetry Data

4.2 Satellite Telemetry Data

The switching state-space analysis of the satellite data is promising and will continue into the spring and summer of 2015. The final data product will be monthly maps of foraging areas and migratory corridors for sea turtles tagged in Virginia. When all tag data have been compiled, we will also conduct a comparison of GPS tag locations in the proximity of receivers to correlate proximity to a receiver with detection by the receiver. In 2015, we will acquire smaller ARGOS-only tags to outfit smaller turtles with satellite transmitters to acquire more data on Kemp's ridley and green turtle movements.

5. Summary

The data collected during this project provide important information on the locations of sea turtles in relation to military facilities and training areas. The acoustic tags provide detailed information on the use of waters adjacent to U.S. Navy facilities in Virginia by sea turtles. Not only are we able to detect the presence of turtles in a military zone, but we can track the approximate duration of a stay within that zone, as well as movement in and out of the area during migration. In the spring of 2015, we will conduct detection trials with range-finding tags purchased under this contract to determine the distance from receivers that turtles must be in order to be detected. This added information will add to our interpretation of these data.

The on-going switching state-space analysis of the satellite data will provide a behavioral component to the detection data provided by the acoustic tags. By identifying foraging versus migratory behavior, we will be able to better understand the presence of turtles in military zones and how they might use the habitat. Long-term displacement away from a foraging area or season, due to construction or other activities, may have a greater impact on sea turtles than displacement from a migratory corridor or during the migratory season. These data will provide the U.S. Navy with detailed temporal and spatial data on sea turtle behavior in the vicinity of military facilities and training areas.

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A

Figures

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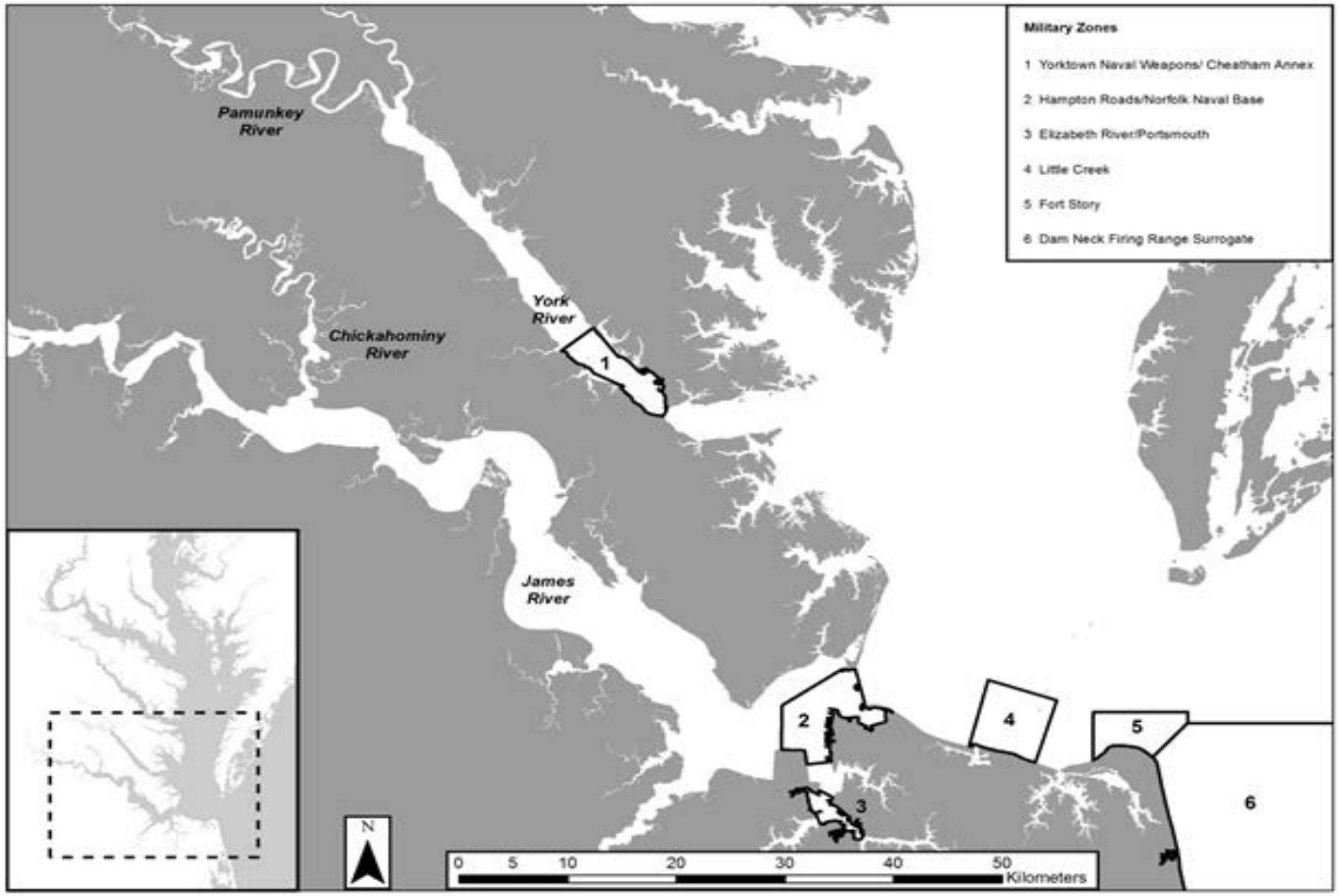

Figure 1: Military zones of interest within Chesapeake Bay where elements of the acoustic receiver array are located (courtesy of Christian Hager, Chesapeake Scientific).

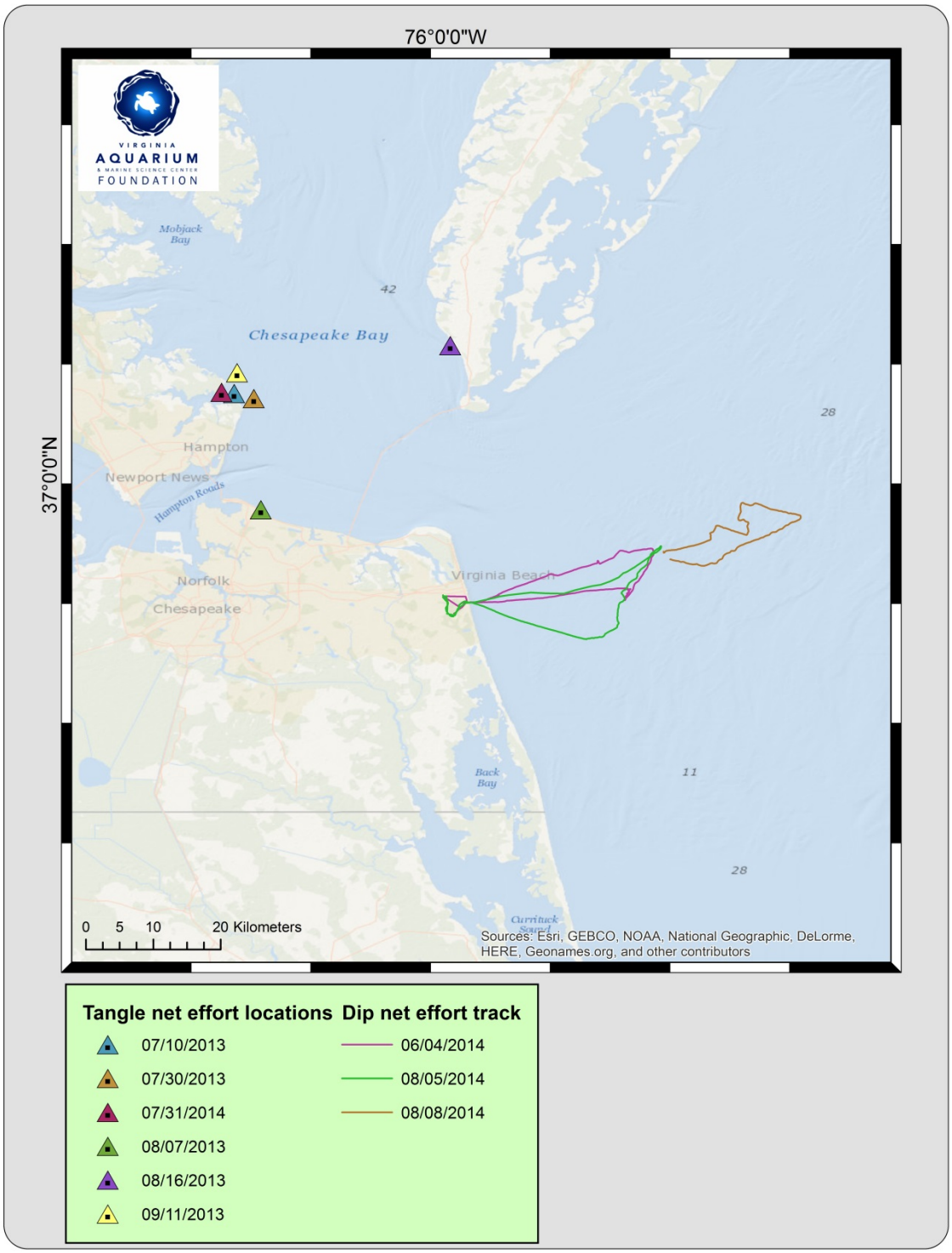

Figure 2: Location of turtle capture efforts in 2013 and 2014. Dip net effort (represented by a line) involved searching for sea turtles while cruising at a slow pace in a vessel. VAQF conducted 196 km of on effort cruising in 2014. Tangle net efforts (represented by triangles) involved deploying a tangle net in a fixed location.

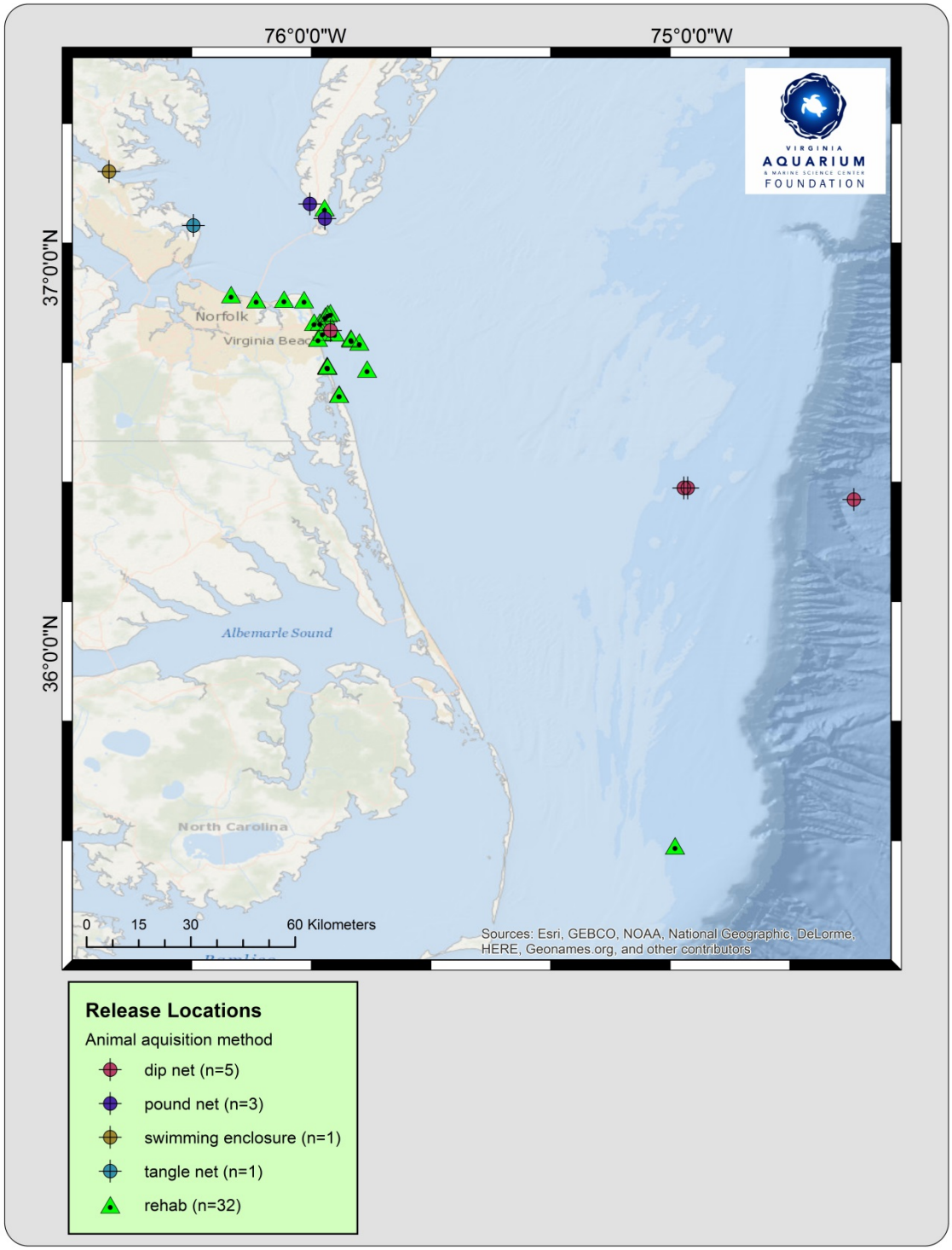

Figure 3: The map shows the release locations for all sea turtles, whose tag data is currently included in the project (2007-2014). The circles represent wild-caught animals and the different colors indicate what acquisition method was used for capture. Capture and release locations are the same for wild-caught animals. Rehabilitated animals stranded at a different location and date than they were released.

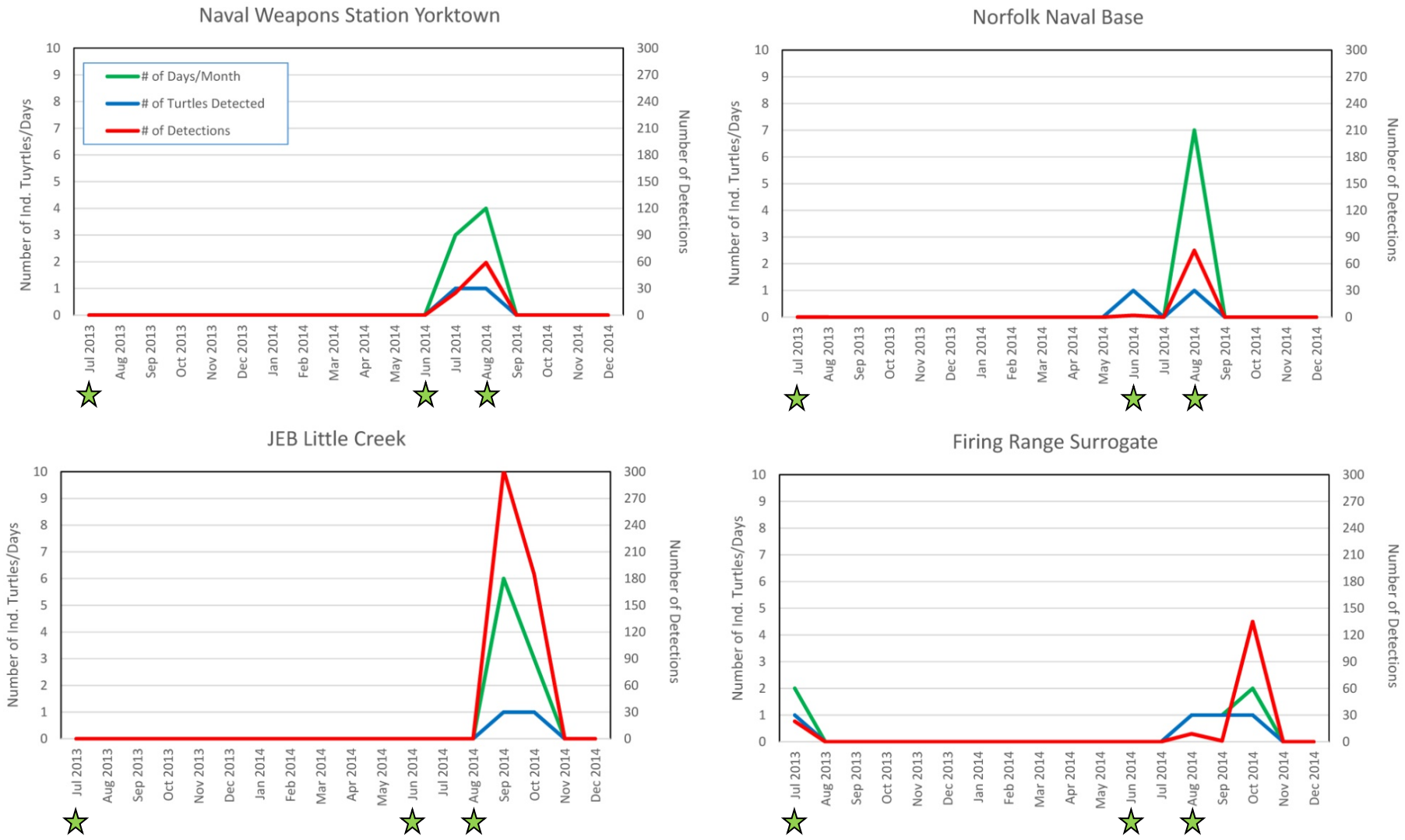

Figure 4: Total numbers of green turtle detections by month for the geographic zones from July 2013 through November 2014. There were no detections in the JEB-Fort Story zone. Stars indicate green turtle tag deployments.

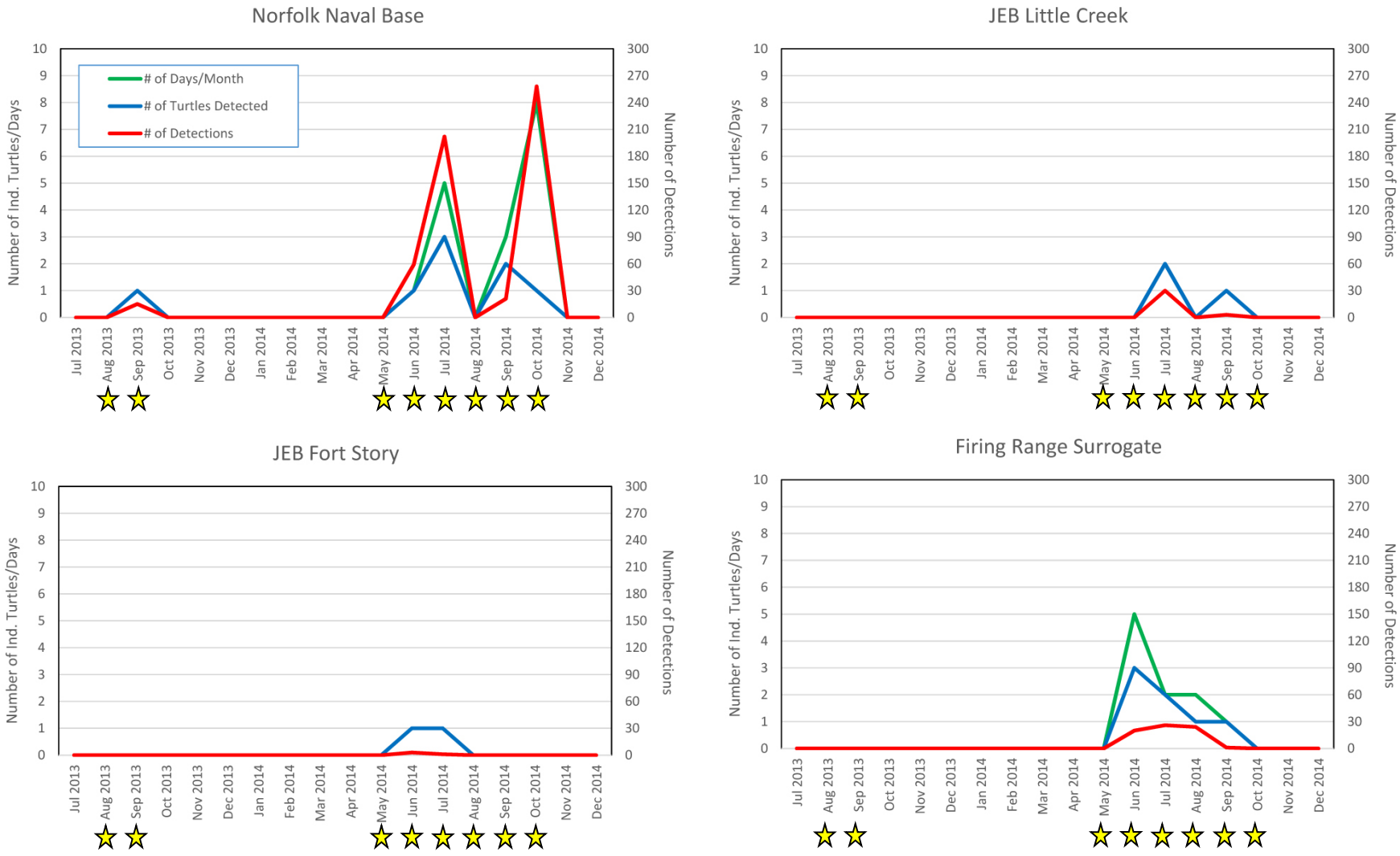

Figure 5: Total numbers of Kemp's ridley detections by month for the geographic zones from July 2013 through November 2014. There were no detections in the Naval Weapons Station Yorktown zone. Stars indicate Kemp's ridley tag deployments.

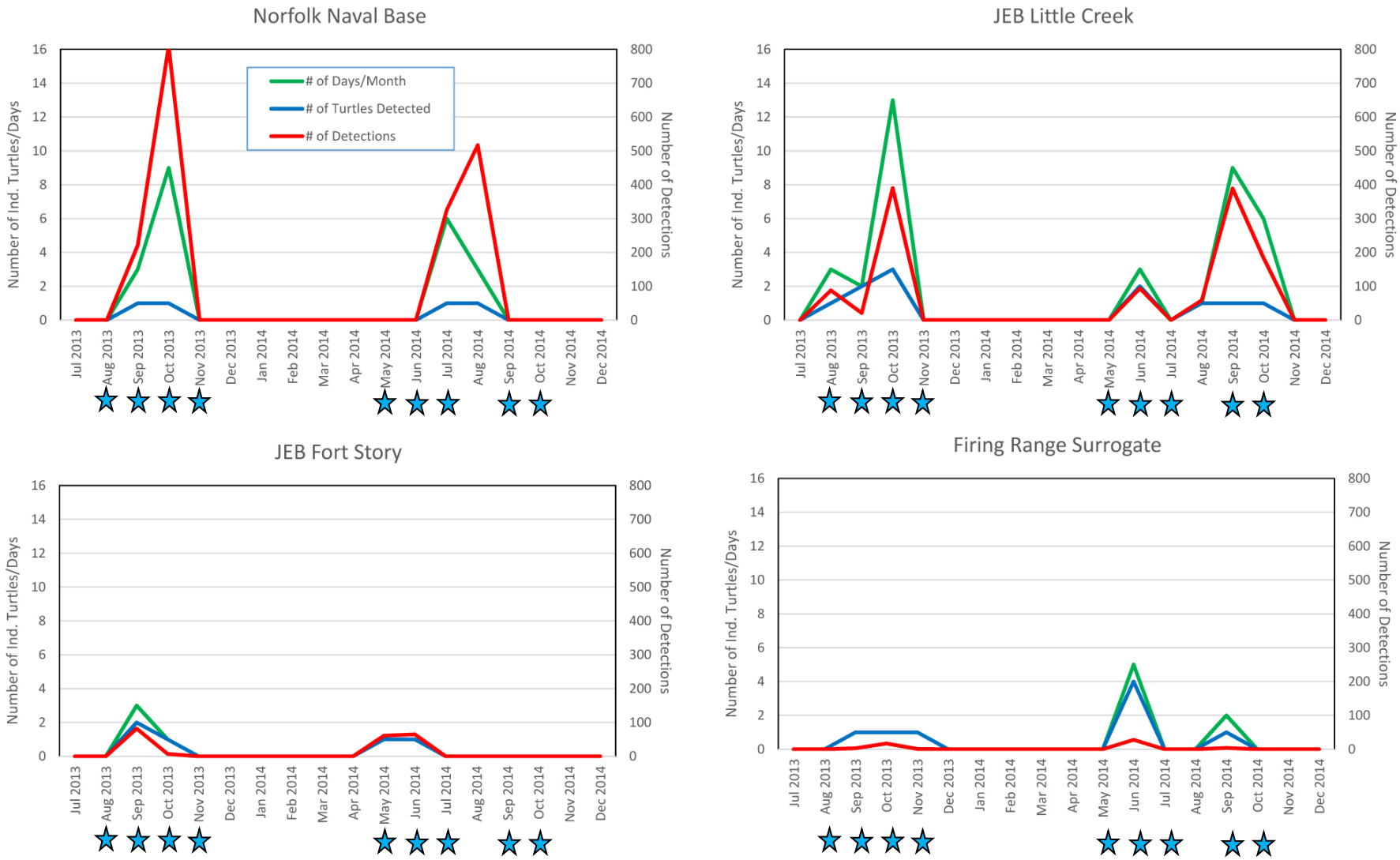

Figure 6: Total numbers of loggerhead detections by month for the geographic zones from July 2013 through November 2014. There were no detections in the Naval Weapons Station Yorktown zone. Stars indicate loggerhead tag deployments.

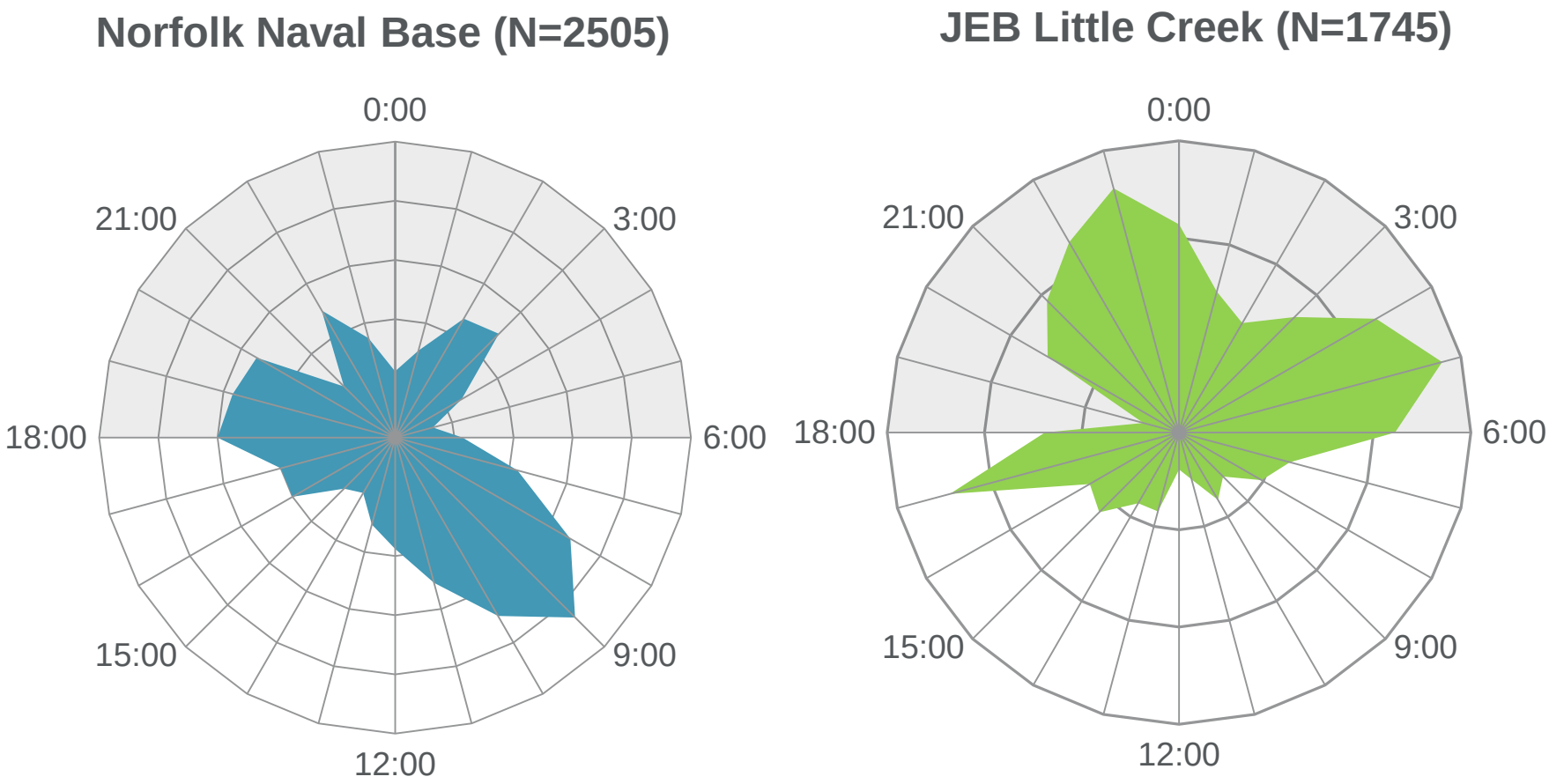

Figure 7: Time of day of turtle detections (EST) in the Norfolk Naval Base Zone (left) and the JEB-Little Creek Zone (right). The areas shaded in gray approximate night time.

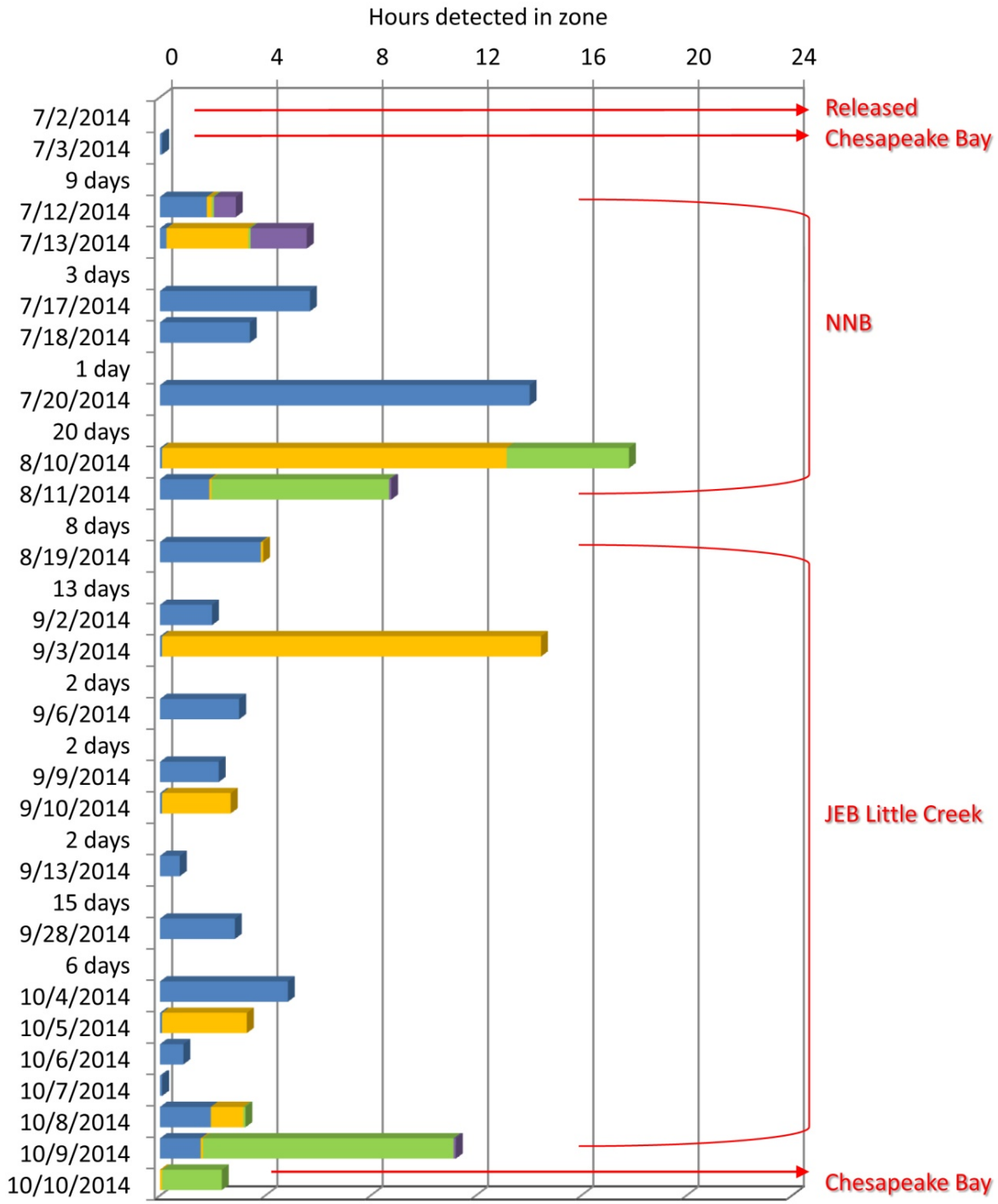

Figure 8: Calendar of data and total time detected in region zones in Virginia for loggerhead VAQS20142111.This turtle was detected 1,516 times on 27 different days, and the last detection was 100 days post-release. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than 60 minutes between detections. A single detection was assumed to equal 5 minutes.

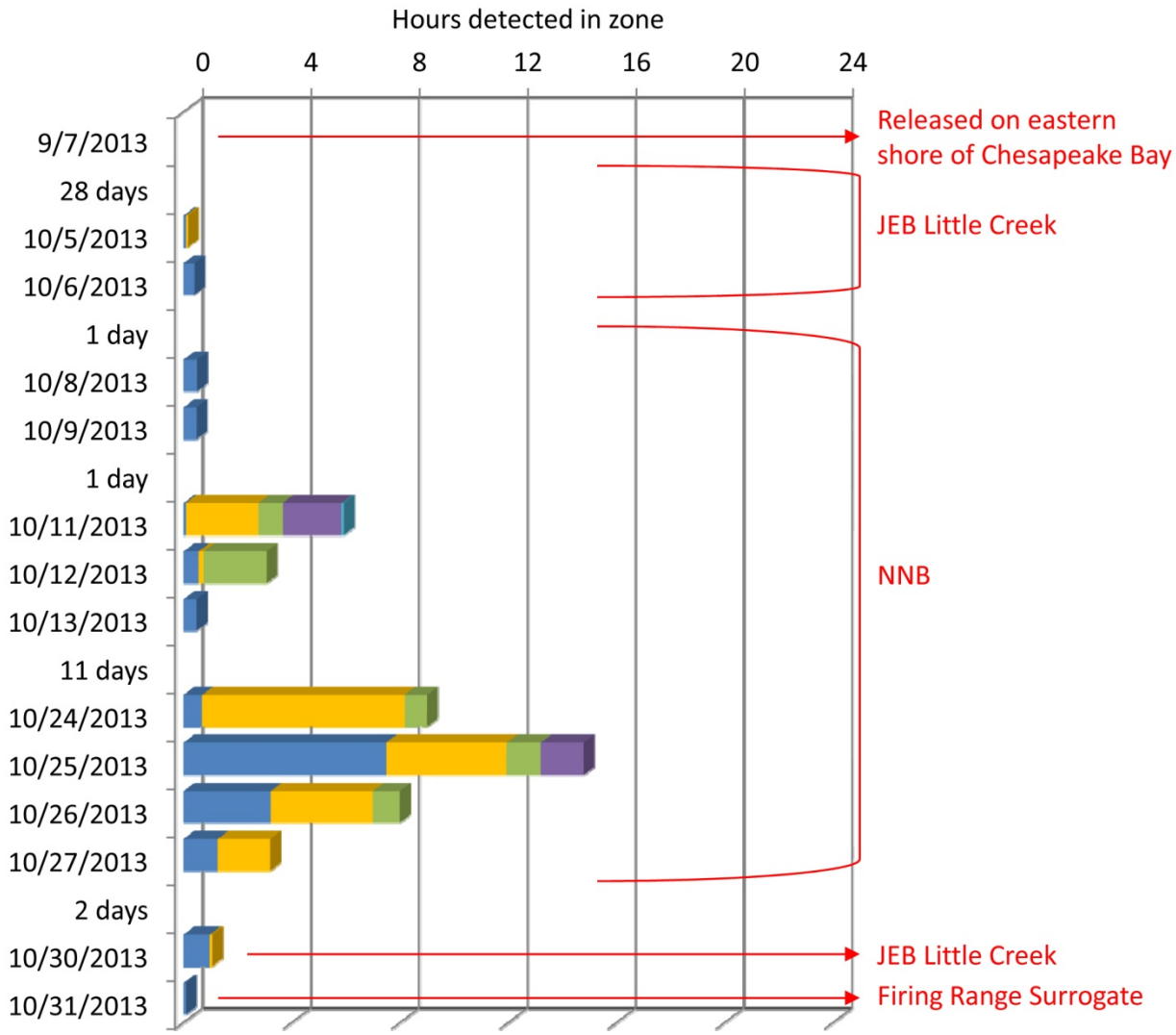

Figure 9: Calendar of data and total time detected in region zones in Virginia for loggerhead VAQR20132015. This turtle was detected 826 times on 13 different days, and was last detected 53 days post-release. This turtle was outfitted with a satellite tag that transmitted for 347 days. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than a 60 minutes between detections. A single detection was assumed to equal 5 minutes.

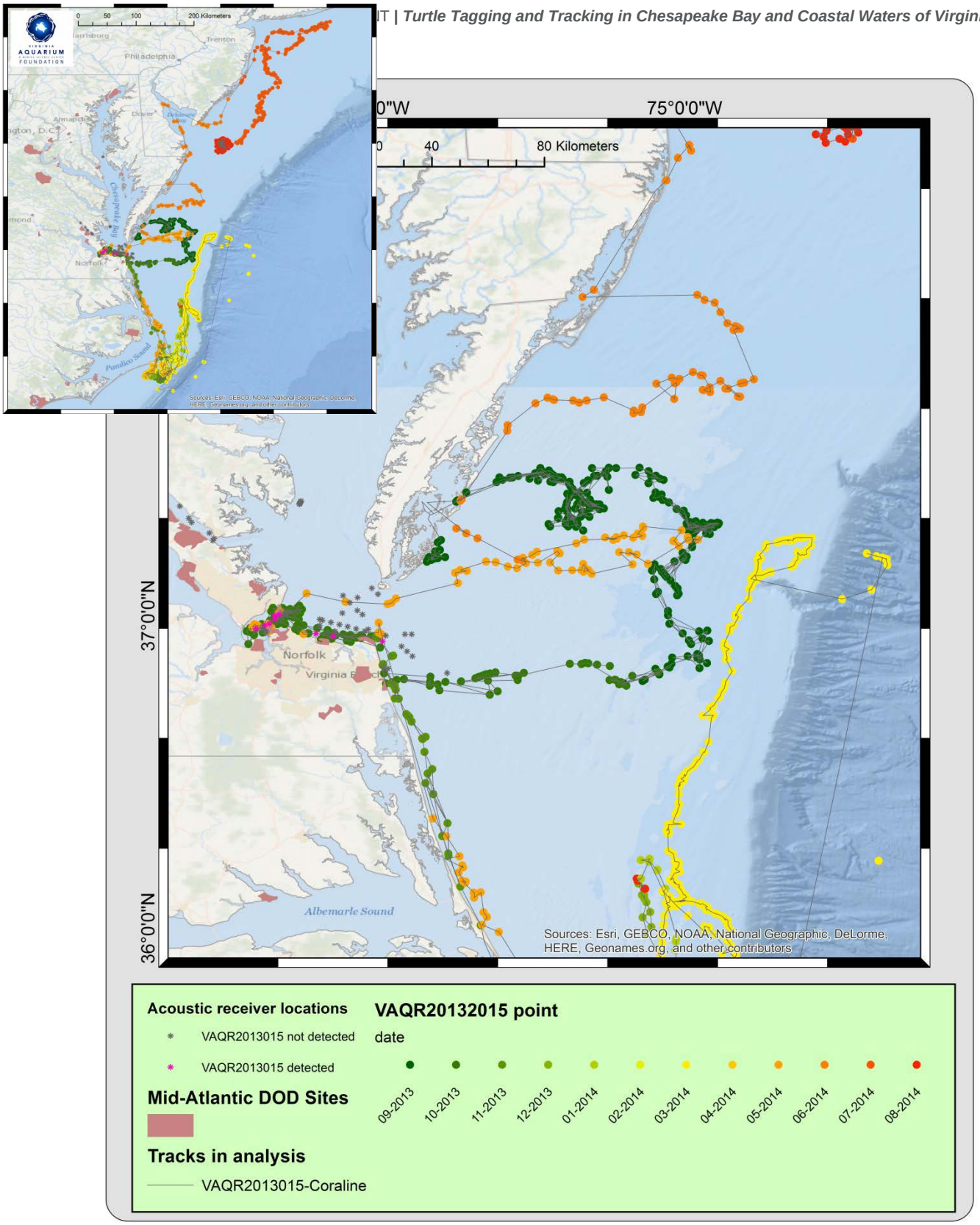

Figure 10: Satellite track and receivers with detections of VAQR20132015. The inset map is the entire satellite track, and the larger map is the track while near the U.S. Navy acoustic receiver array. The legend is the same for both maps. Satellite data indicate that for periods of time when it was not detected on the U.S. Navy array, the turtle was not in the vicinity of the receivers.

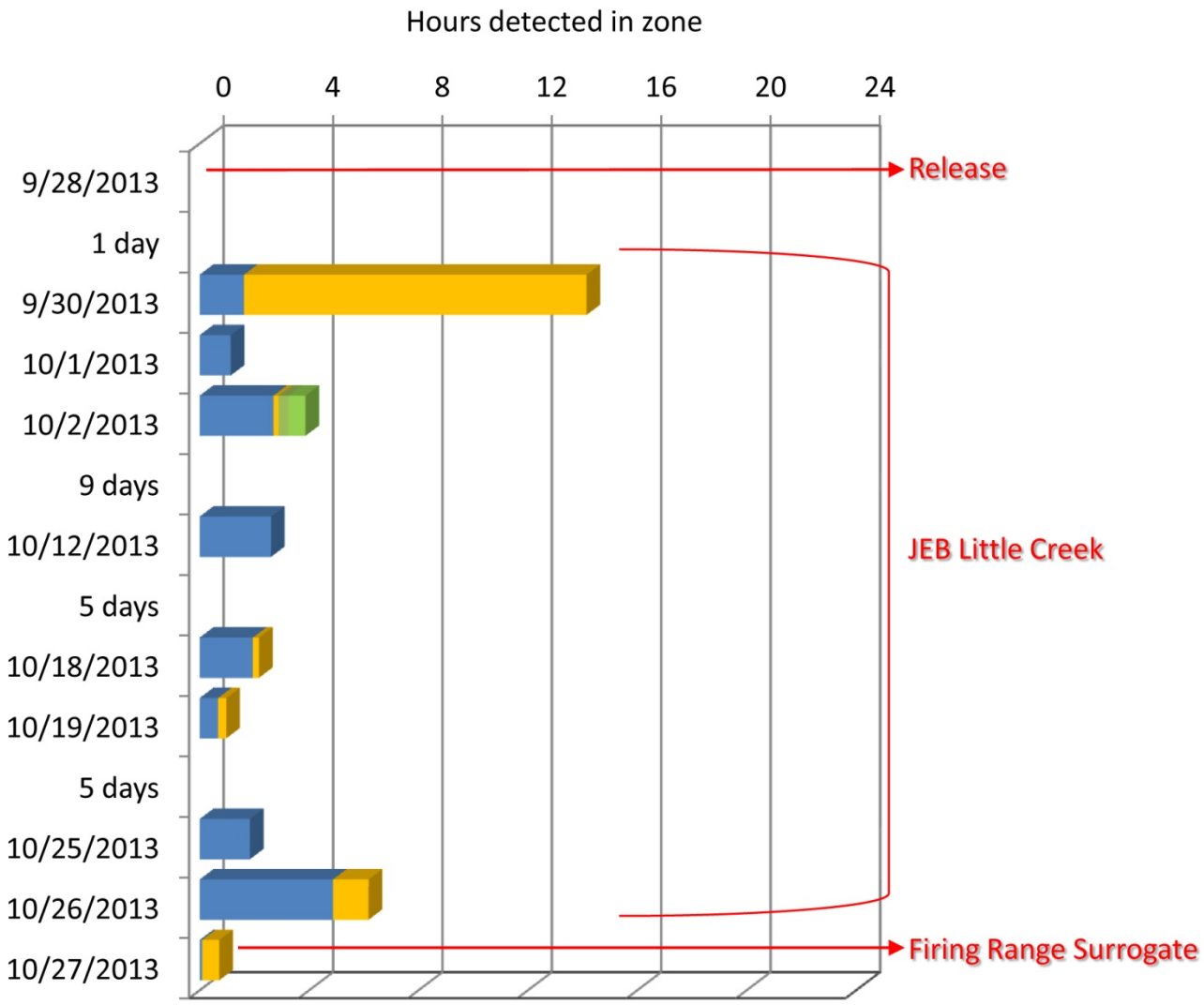

Figure 11: Calendar of data and total time detected in region zones in Virginia for loggerhead VAQS20132106. The turtle was detected 393 times on 10 different days, and was last detected 29 days post-release. This turtle was outfitted with a satellite tag that transmitted for 346 days. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than 60 minutes between detections. A single detection was assumed to equal 5 minutes.

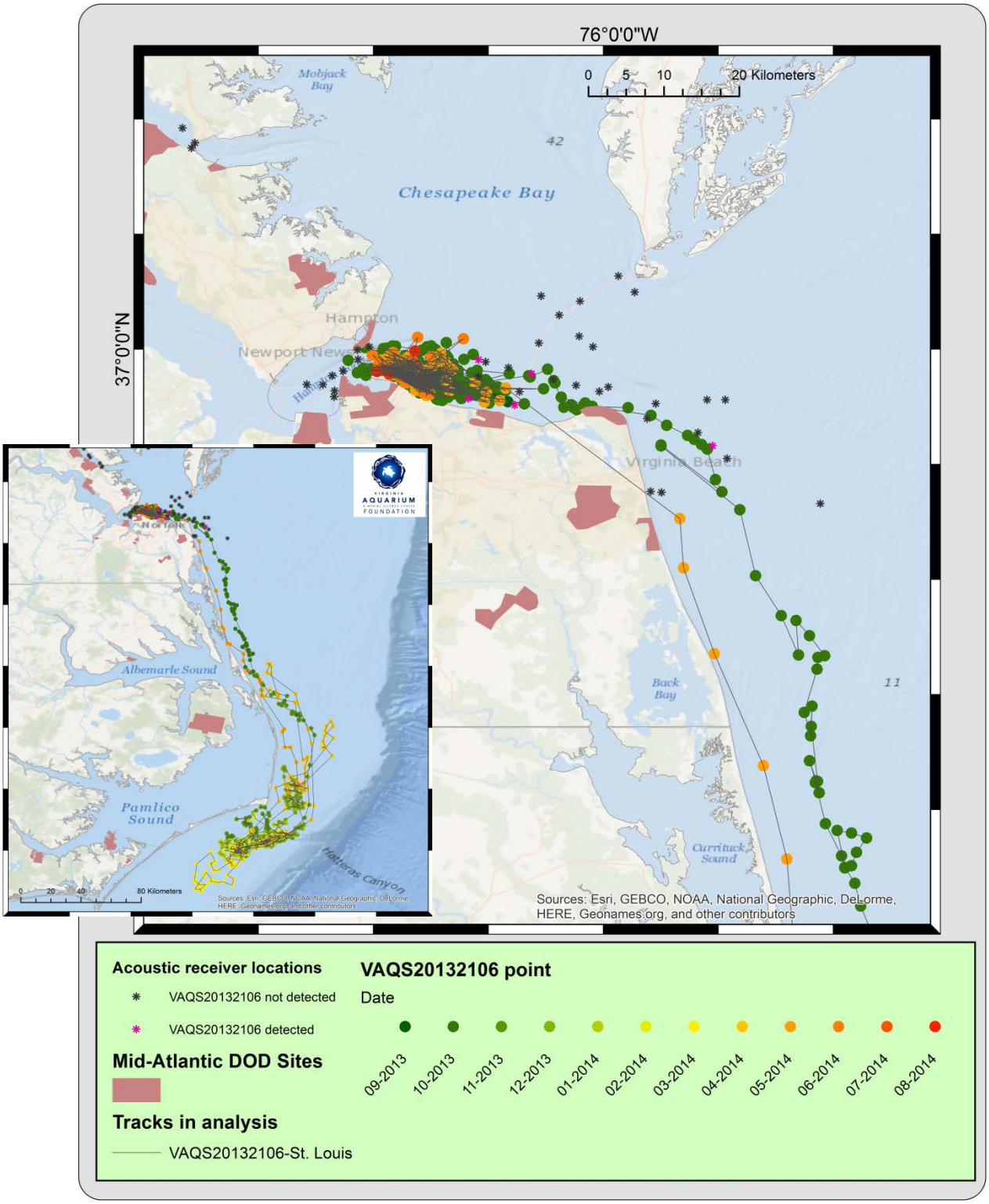

Figure 12: Satellite track and receivers with detections of VAQS20132106. The inset map is the entire satellite track and the larger is the track while near the U.S. Navy acoustic receiver array. The legend is the same for both maps. Satellite data indicate that the turtle returned to the area in 2014 but it was not detected on the acoustic array. The satellite and acoustic tags were attached in the same epoxy footprint suggesting acoustic tag failure since the satellite tag continued transmitting.

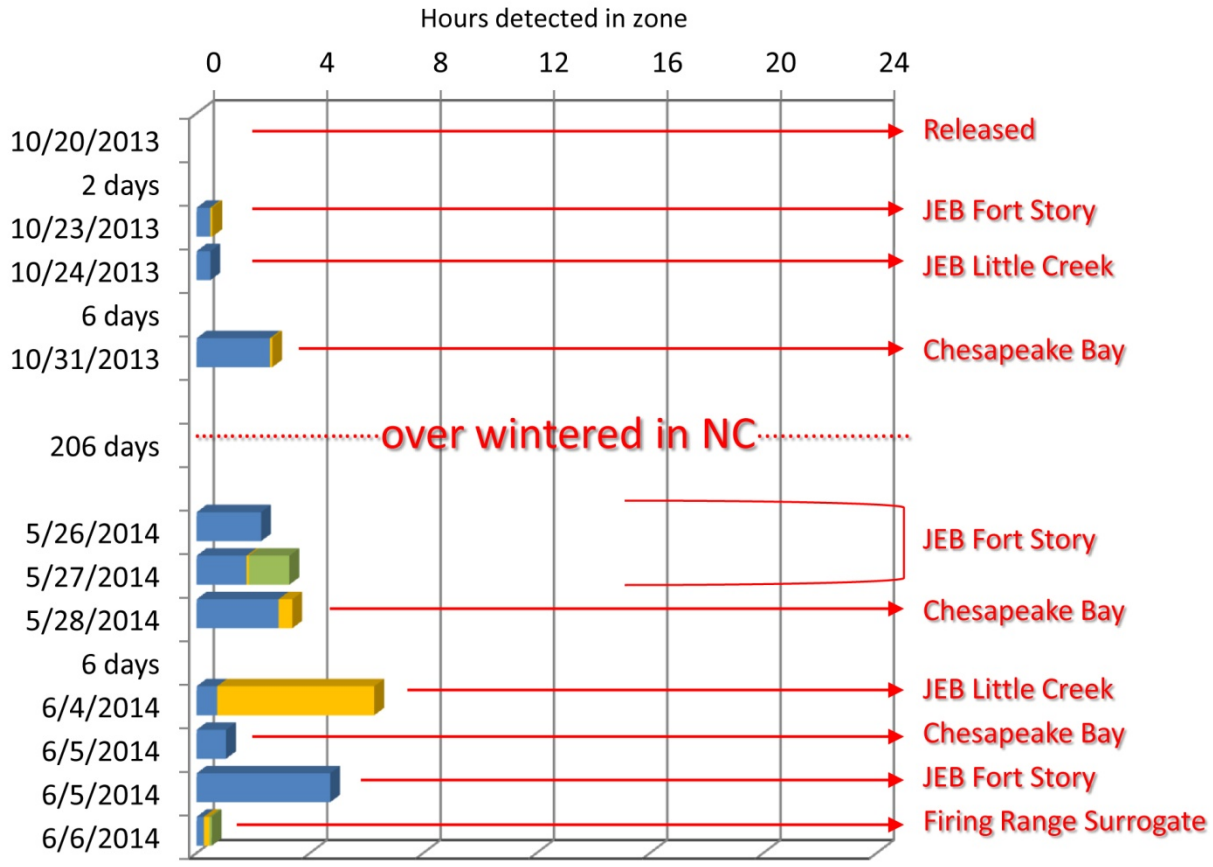

Figure 13: Calendar of data and total time detected in region zones in Virginia for loggerhead VAQS20132102. The turtle was detected 301 times on 9 different days, and was last detected 230 days post-release. This was the only turtle to be detected in two calendar years. The turtle was outfitted with a satellite tag that transmitted for 188 days. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than 60 minutes between detections. A single detection was assumed to equal 5 minutes.

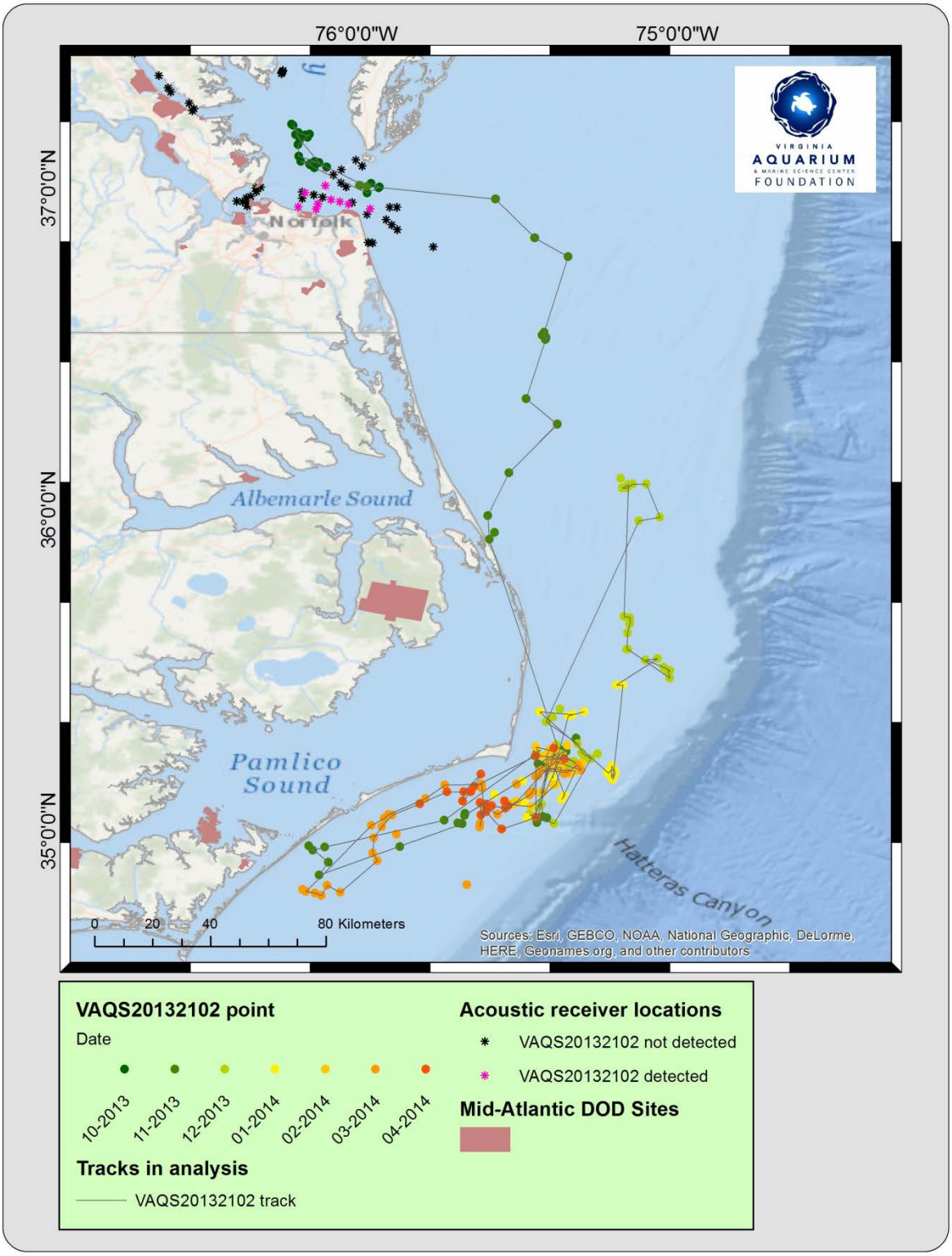

Figure 14: Satellite track and detections on receivers for VAQS20132102 a loggerhead that was released in October of 2013 and was the only turtle thus far to be detected in two different years.

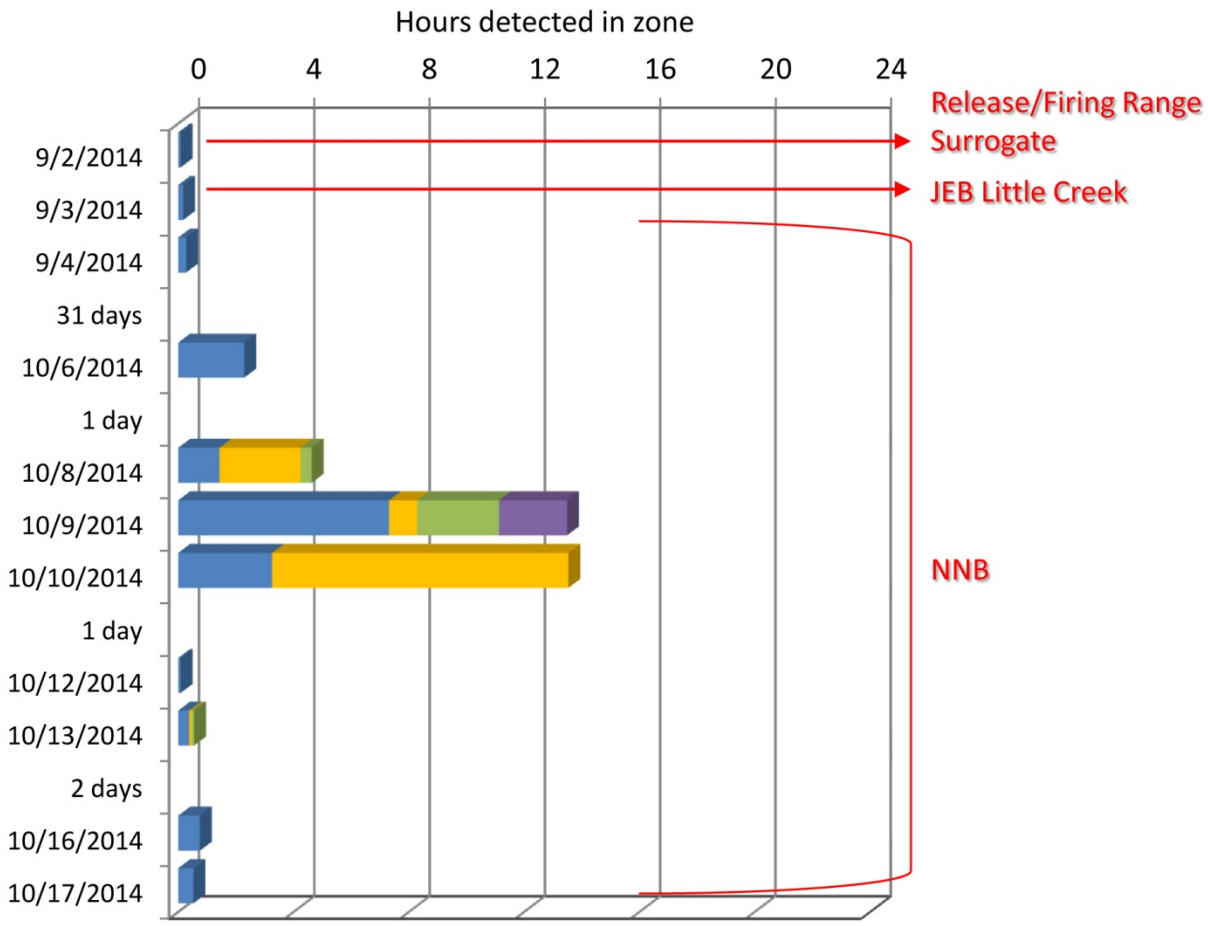

Figure 15: Calendar of data and total time detected in region zones in Virginia for Kemp's ridley VAQS20142152. The turtle was detected 266 times on 10 different days, and was last detected 45 days post-release. The turtle was outfitted with a satellite tag that transmitted for 38 days. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than 60 minutes between detections. A single detection was assumed to equal 5 minutes.

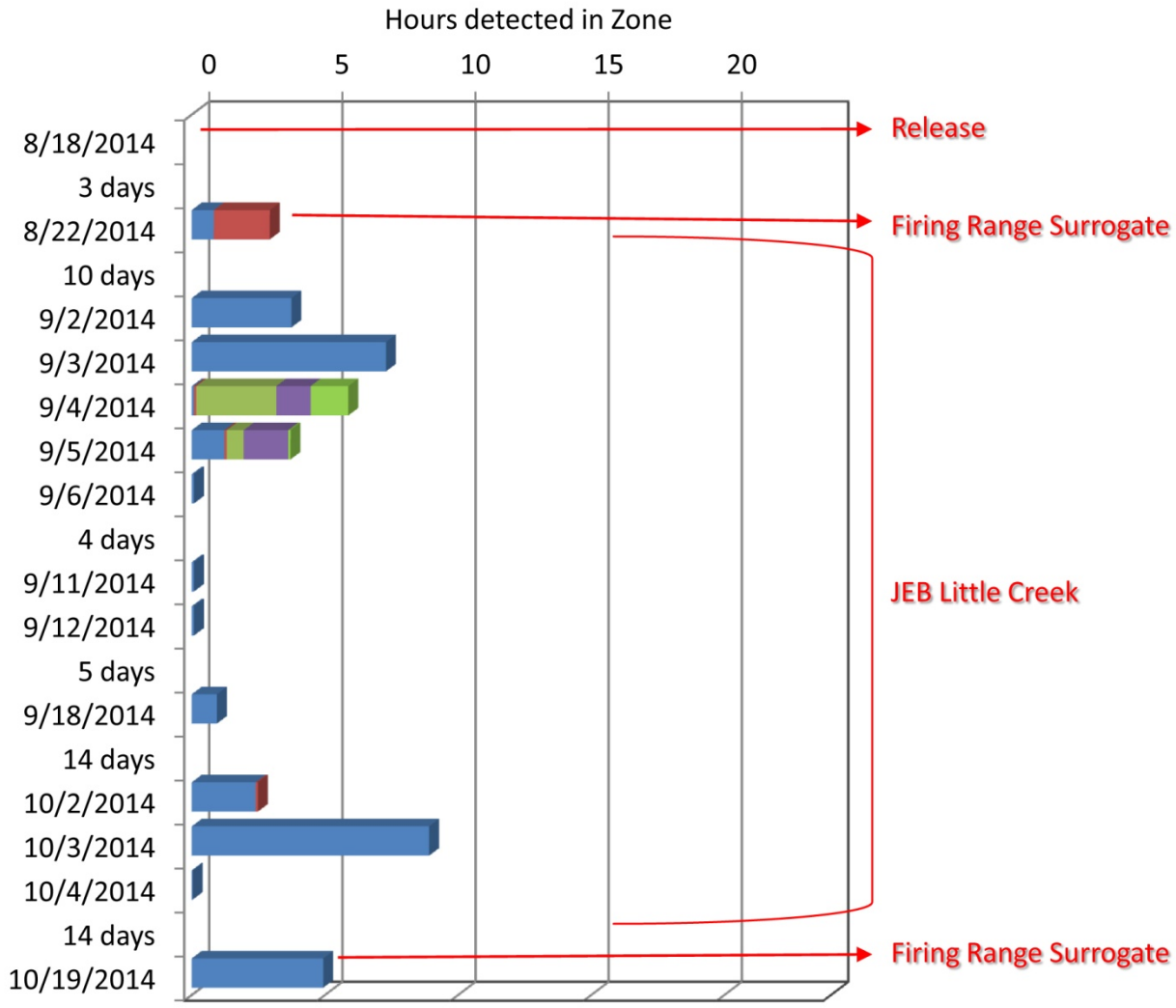

Figure 16: Calendar of data and total time detected in region zones in Virginia for green turtle VAQS20142138. The turtle was detected 631 times on 12 different days, and was last detected 60 days post-release. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than 60 minutes between detections. A single detection was assumed to equal 5 minutes.

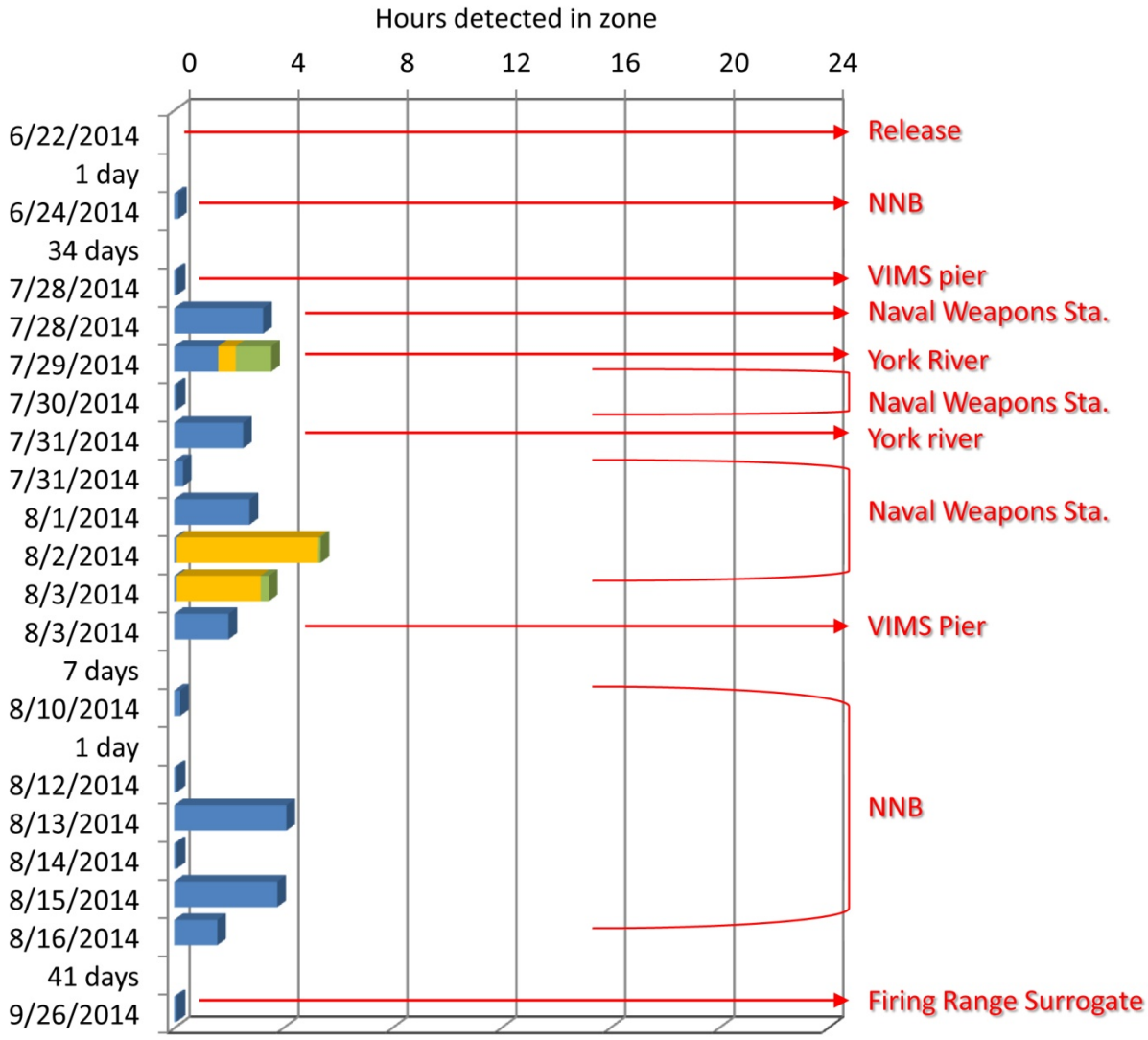

Figure 17: Calendar of data and total time detected in regional zones in Virginia for green turtle VAQS20132220. The turtle was detected 196 times on 17 different days, and was last detected 96 days post-release. The different colors in the bars represent separate time periods where the turtle was detected in the zone with no more than 60 minutes between detections. A single detection was assumed to equal 5 minutes.

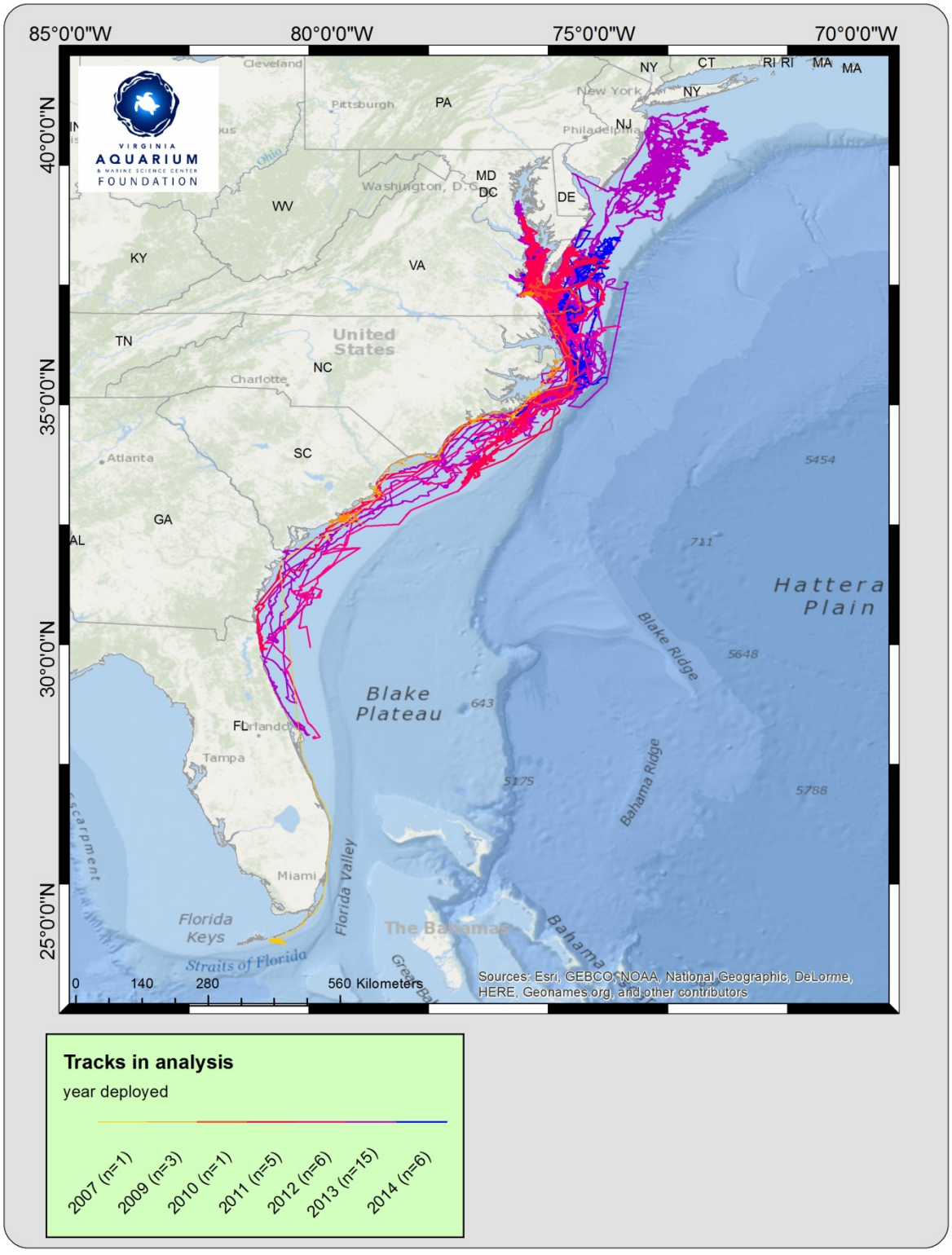

Figure 18: Tracks of 37 satellite tagged turtles in Dataset A.

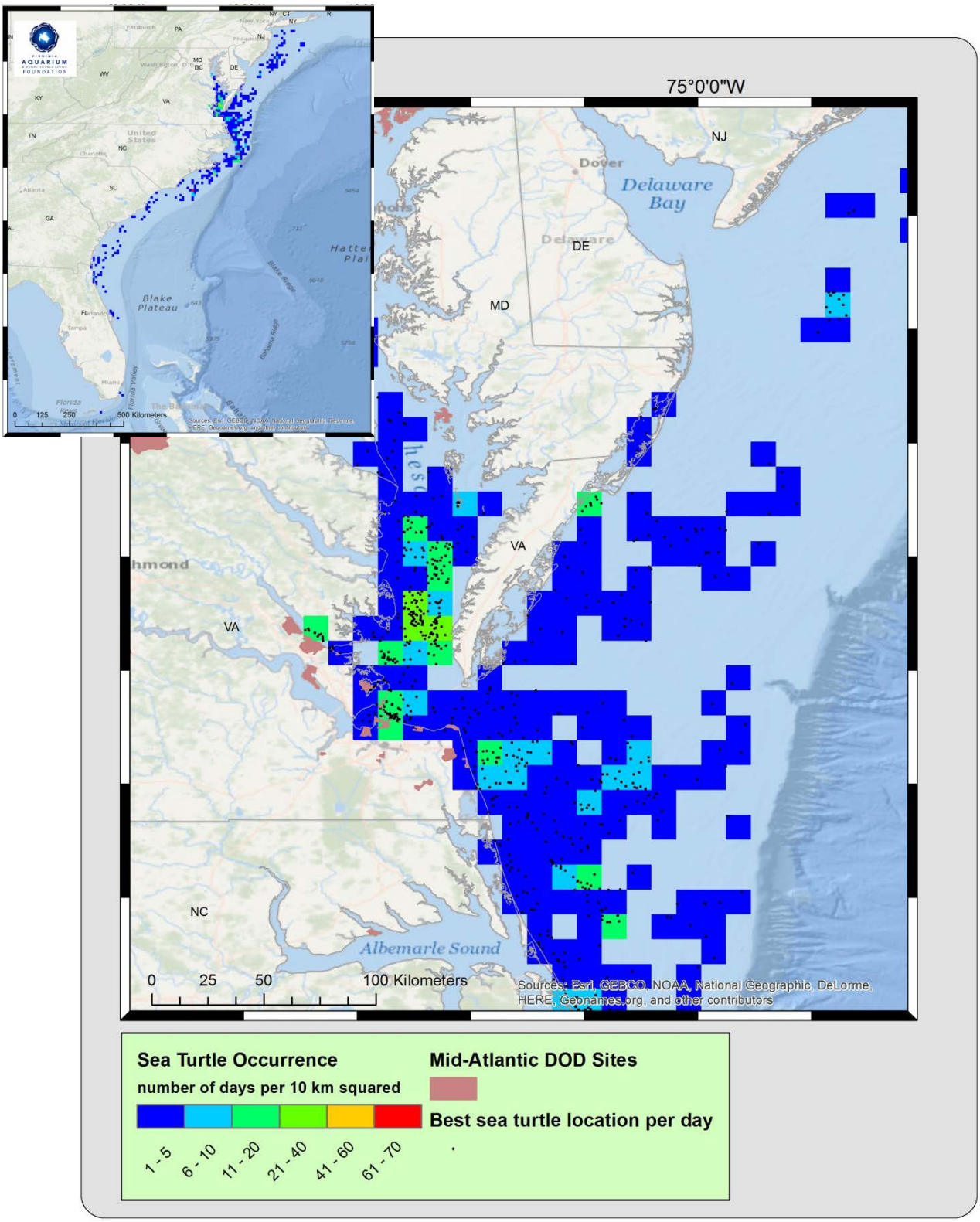

Figure 19: Location of Argos and GPS points in turtle days (1 point per day per turtle) in Dataset A. The color of the grid indicates the number of points per 10 km^2 area. The inset map covers the entire geographic range of the data. The legend is the same for each map.

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Tables

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Table 1: Acoustic tag deployments for the project by species and month.

Acoustic Tags	Green	Kemp's ridley	Loggerhead	Total
2013				
Jul	2	-	-	2
Aug	-	1	1	2
Sep	-	-	5	5
Oct	-	-	4	4
Nov	-	-	1	1
2013 Total	**2**	**1**	**11**	**14**
2014				
May	-	1	-	1
Jun	1	7	3	11
Jul	-	3	2	5
Aug	1	2	-	3
Sep	-	1	1	2
Oct	-	1	1	2
2014 Total	**2**	**15**	**7**	**24**
Project Total	**4**	**16**	**18**	**38**

Table 2: Satellite tag deployments for the project by species and month.

Satellite tags	Green	Loggerhead	Kemp's ridley	Total	Non-U.S. Navy Tags
2013					
Aug	-	-	-	-	1
Sep	-	2	-	2	3
Oct	-	3	-	3	1
Nov	-	1	-	1	-
2013 Total	**-**	**6**	**-**	**6**	**5**
2014					
Jun	-	3	-	3	1
Jul	-	-	1	1	-
Aug	-	-	-	-	-
Sep	-	1	1	2	-
Oct	-	1	1	2	-
2014 Total	**-**	**5**	**3**	**8**	**1**
Project Total	**-**	**11**	**3**	**14**	**6**

Table 3: Summary statistics by species for acoustic detections. These include all detections on any array. Three turtles were not detected on the U.S. Navy array but were detected on other arrays.

Parameter	Green	Kemp's ridley	Loggerhead
Number tagged	4	16	18
Number detected	3	11	14
Not detected	25%	31%	22%
Known deaths	1	2	3
Detected turtles that were alive at least 30 days from release			
Maximum days detected post release	96	76	265
Average days detected post release	53	21	82
Maximum number detections	311	266	1292
Average number detections	141	42	184
Maximum days detected	17	10	27
Average days detected	8	2	5

Table 4: Acoustic detections on the U.S. Navy receiver array by month. Detections were highest in October of each year.

Month	Number detections	Number detected	Number deployed*	% Detected
July 2013	23	1	2	50%
August 2013	88	1	4	25%
September 2013	354	6	9	67%
October 2013	1254	3	11	27%
November 2013	1	1	5	20%
May 2014	80	1	1	100%
Jun 2014	286	8	11	73%
July 2014	646	5	16	31%
August 2014	743	4	7	57%
September 2014	721	6	5	120%
October 2014	802	3	4	75%

* Number deployed 60 days prior to last day of month

Table 5: Detections from receivers near Norfolk Naval Base. The highest numbers of detections were in this military zone. The legend to the right indicates color coding for number of detections.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Receiver	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Green	James River	NN8	N. Naval B.	-	-	-	-	-	-	-	-	1	-	-	**1**
	James River	NH10	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NN12	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	Eliz. River	NH8	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NN5	N. Naval B.	-	-	-	-	-	-	-	-	3	-	-	**3**
	James River	NH5	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NN2	N. Naval B.	-	-	-	-	-	-	-	-	5	-	-	**5**
	James River	NN 3ER NOAA	N. Naval B.	-	-	-	-	-	-	-	-	46	-	-	**46**
	James River	NN 1ER FWS	N. Naval B.	-	-	-	-	-	-	-	-	2	-	-	**2**
	James River	NN DAN FWS	N. Naval B.	-	-	-	-	-	-	2	-	8	-	-	**10**
	James River	NN 22 NOAA	N. Naval B.	-	-	-	-	-	-	-	-	10	-	-	**10**
Sub-total				**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**75**	**-**	**-**	**77**
Kemp's	James River	NN8	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
ridley	James River	NH10	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NN12	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	Eliz. River	NH8	N. Naval B.	-	-	-	-	-	-	-	-	-	-	9	**9**
	James River	NN5	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NH5	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NN2	N. Naval B.	-	-	-	-	-	-	-	1	-	-	-	**1**
	James River	NN 3ER NOAA	N. Naval B.	-	-	5	-	-	-	3	33	-	15	-	**56**
	James River	NN 1ER FWS	N. Naval B.	-	-	9	-	-	-	26	13	-	-	44	**92**
	James River	NN DAN FWS	N. Naval B.	-	-	-	-	-	-	13	32	-	-	-	**45**
	James River	NN 22 NOAA	N. Naval B.	-	-	1	-	-	-	17	123	-	6	205	**352**
Sub-total				**-**	**-**	**15**	**-**	**-**	**-**	**59**	**202**	**-**	**21**	**258**	**555**

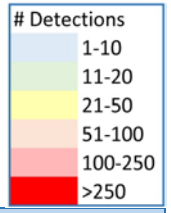
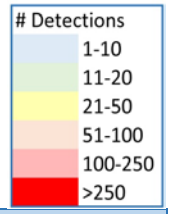


Table 5: Cont.

Species	Region	Station	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Loggerhead	James River	NN8	N. Naval B.	-	-	75	112	-	-	-	-	-	-	-	**187**
	James River	NH10	N. Naval B.	-	-	2	-	-	-	-	-	-	-	-	**2**
	James River	NN12	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	Eliz. River	NH8	N. Naval B.	-	-	83	-	-	-	-	-	-	-	-	**83**
	James River	NN5	N. Naval B.	-	-	3	-	-	-	-	-	-	-	-	**3**
	James River	NH5	N. Naval B.	-	-	-	-	-	-	-	-	-	-	-	**-**
	James River	NN2	N. Naval B.	-	-	27	85	-	-	-	-	-	-	-	**112**
	James River	NN 3ER NOAA	N. Naval B.	-	-	4	9	-	-	-	-	-	-	-	**13**
	James River	NN 1ER FWS	N. Naval B.	-	-	8	31	-	-	-	-	-	-	-	**39**
	James River	NN DAN FWS	N. Naval B.	-	-	14	3	-	-	-	72	-	-	-	**89**
	James River	NN 22 NOAA	N. Naval B.	-	-	5	569	-	-	-	254	517	-	-	**1345**
Sub-total				**-**	**-**	**221**	**809**	**-**	**-**	**-**	**326**	**517**	**-**	**-**	**1873**
Total				**-**	**-**	**236**	**809**	**-**	**-**	**61**	**528**	**592**	**21**	**258**	**2505**

Table 6: Detections on receivers in Chesapeake Bay not associated with a military zone. The legend to the right indicates color coding for number of detections.



Species	Region	Station	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
No green detections															
Kemp's ridley	Chesapeake Bay	B15	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		B13	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT0	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT1/LS	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT2	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT7	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT3	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		11N	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		10N	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		B11	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		B9	None	-	-	-	-	-	-	8	-	-	-	-	**8**
		TS5	None	-	-	-	-	-	-	-	1	-	-	-	**1**
		B7	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		B5	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		10 off c. char.	None	-	-	-	-	-	-	-	-	-	-	-	**4**
Sub-total				**-**	**-**	**-**	**-**	**-**	**-**	**8**	**1**	**-**	**-**	**-**	**9**

Table 6: Cont.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Station	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Loggerhead	Chesapeake Bay	B15	None	-	-	-	32	-	-	-	-	-	-	-	**32**
		B13	None	-	-	4	-	-	-	-	-	-	-	-	**4**
		CBBT0	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT1/LS	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT2	None	-	-	-	1	-	-	-	1	-	-	-	**2**
		CBBT7	None	-	-	1	-	-	-	-	-	-	-	-	**1**
		CBBT3	None	-	-	-	-	-	10	-	-	-	-	-	**10**
		11N	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		10N	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		B11	None	-	-	3	-	-	-	-	-	-	-	-	**3**
		B9	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		TS5	None	-	-	-	-	-	9	8	-	-	-	40	**57**
		B7	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		B5	None	-	-	-	-	-	-	-	-	-	-	-	**-**
		10 off c. char.	None	-	-	4	-	-	-	-	-	-	-	-	**4**
Sub-total				**-**	**-**	**12**	**33**	**-**	**19**	**8**	**1**	**-**	**-**	**40**	**113**
Total				**-**	**-**	**12**	**33**	**-**	**19**	**16**	**2**	**-**	**-**	**40**	**122**

Table 7: Detections on receivers associated with Joint Expeditionary Base-Little Creek. JEB-Little Creek receivers had the second highest numbers of detections in a military zone after the Norfolk Naval Base. The legend to the right indicates color coding for number of detections.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Station	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Green	Chesapeake Bay	LC1	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		TS11	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		LC2	Little Creek	-	-	-	-	-	-	-	-	-	81	182	**263**
		TS9	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		TS7	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT4	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT5	Little Creek	-	-	-	-	-	-	-	-	-	221	3	**224**
Sub-total													**302**	**185**	**487**
Kemp's ridley	Chesapeake Bay	LC1	Little Creek	-	-	-	-	-	-	-	3	-	-	-	**3**
		TS11	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		LC2	Little Creek	-	-	-	-	-	-	-	7	-	3	-	**10**
		TS9	Little Creek	-	-	-	-	-	-	-	9	-	-	-	**9**
		TS7	Little Creek	-	-	-	-	-	-	-	10	-	-	-	**10**
		CBBT4	Little Creek	-	-	-	-	-	-	-	-	-	-	-	**-**
		CBBT5	Little Creek	-	-	-	-	-	-	-	1	-	-	-	**1**
Sub-total											**3-**		**3**		**33**
Loggerhead	Chesapeake Bay	LC1	Little Creek	-	14	-	127	-	-	-	-	58	-	-	**199**
		TS11	Little Creek	-	40	7	9	-	-	4	-	-	354	184	**598**
		LC2	Little Creek	-	34	-	107	-	-	18	-	1	-	-	**160**
		TS9	Little Creek	-	-	-	-	-	-	-	-	-	35	-	**35**
		TS7	Little Creek	-	-	-	140	-	-	-	-	-	-	-	**140**
		CBBT4	Little Creek	-	-	-	2	-	-	3	-	-	-	-	**5**
		CBBT5	Little Creek	-	-	14	5	-	-	69	-	-	-	-	**88**
Sub-total				**-**	**88**	**21**	**390**	-	-	**94**		**59**	**389**	**184**	**1225**
Total				**-**	**88**	**21**	**390**	**-**	**-**	**94**	**30**	**59**	**694**	**369**	**1745**

Table 8: Detections associated with Joint Expeditionary Base-Fort Story.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Receiver	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
No green detections															
Kemp's ridley	Chesapeake Bay	TS3	Fort Story	-	-	-	-	-	-	-	-	-	-	-	**-**
		2CH off hen.	Fort Story	-	-	-	-	-	-	-	1	-	-	-	**1**
		TS1	Fort Story	-	-	-	-	-	-	3	-	-	-	-	**3**
		B3	Fort Story	-	-	-	-	-	-	-	-	-	-	-	**-**
		2C Henry	Fort Story	-	-	-	-	-	-	-	-	-	-	-	**-**
Sub-total				**-**	**-**	**-**	**-**	**-**	**-**	**3**	**1**	**-**	**-**	**-**	**4**
Loggerhead	Chesapeake Bay	TS3	Fort Story	-	-	35	-	-	54	36	-	-	-	-	**125**
		2CH off hen.	Fort Story	-	-	40	-	-	-	-	-	-	-	-	**40**
		TS1	Fort Story	-	-	7	7	-	7	29	-	-	-	-	**50**
		B3	Fort Story	-	-	-	-	-	-	-	-	-	-	-	**-**
		2C Henry	Fort Story	-	-	-	-	-	-	-	-	-	-	-	**-**
Sub-total				**-**	**-**	**82**	**7**	**-**	**61**	**65**	**-**	**-**	**-**		**215**
Total				**-**	**-**	**82**	**7**	**-**	**61**	**68**	**1**	**-**	**-**	**-**	**219**

Table 9: Detections in the Atlantic Ocean in the Naval Air Station Ocean Dam Neck Annex Firing Range Surrogate. The legend to the right indicates color coding for number of detections.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Receiver	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Green	Atlantic Ocean	CB	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB1	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB3	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB5	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCB	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB7	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RA out.	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB9	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCC	F. Range S.	16	-	-	-	-	-	-	-	-	-	-	**16**
		CB11	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RA out.	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB13	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCD	F. Range S.	2	-	-	-	-	-	-	-	-	-	-	**2**
		NCE	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB15	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CH	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RI2	F. Range S.	-	-	-	-	-	-	-	-	9	1	-	**10**
		RI	F. Range S.	5	-	-	-	-	-	-	-	-	-	135	**140**
		RRI	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CH1	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
Sub-total				**23**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**9**	**1**	**135**	**168**

Table 9: Cont.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Receiver	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Kemp's ridley	Atlantic Ocean	CB	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB1	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB3	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB5	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCB	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB7	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RA out.	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB9	F. Range S.	-	-	-	-	-	-	6	1	-	-	-	**7**
		NCC	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB11	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RA out.	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB13	F. Range S.	-	-	-	-	-	-	-	4	-	-	-	**4**
		NCD	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCE	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB15	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CH	F. Range S.	-	-	-	-	-	-	3	-	-	-	-	**3**
		RI2	F. Range S.	-	-	-	-	-	-	11	21	2	-	-	**34**
		RI	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RRI	F. Range S.	-	-	-	-	-	-	-	-	22	1	-	**23**
		CH1	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
Sub-total				**-**	**-**	**-**	**-**	**-**	**-**	**20**	**26**	**24**	**1**	**-**	**71**

Table 9: Cont.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Receiver	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Total
Loggerhead	Atlantic Ocean	CB	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB1	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB3	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB5	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCB	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB7	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		RA out.	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB9	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCC	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB11	F. Range S.	-	-	-	16	-	-	-	-	-	-	-	**16**
		RA out.	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB13	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		NCD	F. Range S.	-	-	-	-	-	-	1	-	-	-	-	**1**
		NCE	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CB15	F. Range S.	-	-	-	-	-	-	-	-	-	-	-	**-**
		CH	F. Range S.	-	-	-	-	-	-	9	-	-	-	-	**9**
		RI2	F. Range S.	-	-	3	-	-	-		-	-	-	-	**3**
		RI	F. Range S.	-	-	-	-	-	-	18	-	-	-	-	**18**
		RRI	F. Range S.	-	-	-	-	-	-	-	-	-	1	-	**1**
		CH1	F. Range S.	-	-	-	1	1	-	-	-	-	-	-	**2**
Sub-total				**-**	**-**	**3**	**17**	**1**	**-**	**28**	**-**	**-**	**4**	**-**	**53**
Total				**23**	**-**	**3**	**17**	**1**	**-**	**48**	**26**	**33**	**6**	**135**	**292**

Table 10: Detections from York River receivers and in the Naval Weapons Station Yorktown military zone. All detections were of one individual green turtle. The legend to the right indicates color coding for number of detections.

Detections
1-10
11-20
21-50
51-100
100-250
>250

Species	Region	Receiver	Military Zone	Jul 2013	Aug 2013	Sep 2013	Oct 2013	Nov 2013	May 2014	Jun 2014	Jul 2014	Aug 2014	Sep 2014	Oct 2014	Nov 2014	Total
Green	York River	Y29	None	-	-	-	-	-	-	-	-	-	-	-	-	**-**
		Y Bell	None	-	-	-	-	-	-	-	-	-	-	-	-	**-**
		Y20	None	-	-	-	-	-	-	-	-	-	-	-	-	**-**
		Y18 noaa	None	-	-	-	-	-	-	-	24	-	-	-	-	**24**
		Y12	None	-	-	-	-	-	-	-	10	-	-	-	-	**10**
		Y8	Weap. Sta.	-	-	-	-	-	-	-	15	31	-	-	-	**46**
		Ypages	Weap. Sta.	-	-	-	-	-	-	-	1	21	-	-	-	**22**
		Y2	Weap. Sta.	-	-	-	-	-	-	-	5	-	-	-	-	**5**
		Y wat	Weap. Sta.	-	-	-	-	-	-	-	4	7	-	-	-	**11**
Sub-total				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**59**	**59**	**-**	**-**	**-**	**118**
No Kemp's ridley detections																
No Loggerhead detections																
Total				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**59**	**59**	**-**	**-**	**-**	**118**

Table 11: Numbers of different turtles detected by each receiver in the U.S. Navy array.

Region	Receiver	Military Zone	Green	Kemp's ridley	Loggerhead	Total individuals
York River	Y18 noaa	None	1	-	-	**1**
York River	Y12	None	1	-	-	**1**
York River	Y8	Weap. Sta.	1	-	-	**1**
York River	Ypages	Weap. Sta.	1	-	-	**1**
York River	Y2	Weap. Sta.	1	-	-	**1**
York River	Y wat	Weap. Sta.	1	-	-	**1**
James River	NN8	N. Naval B.	1	-	2	**3**
James River	NH10	N. Naval B.	-	-	1	**1**
Elizabeth River	NH8	N. Naval B.	-	-	1	**1**
James River	NN2	N. Naval B.	1	1	2	**4**
James River	NN 3ER NOAA	N. Naval B.	1	5	2	**8**
James River	NN 1ER FWS	N. Naval B.	1	4	2	**7**
James River	NN DAN FWS	N. Naval B.	1	2	3	**6**
James River	NN 22 NOAA	N. Naval B.	1	5	3	**9**
Chesapeake Bay	B15	None	-	-	1	**1**
Chesapeake Bay	B13	None	-	-	1	**1**
Chesapeake Bay	CBBT2	None	-	-	1	**1**
Chesapeake Bay	CBBT7	None	-	-	1	**1**
Chesapeake Bay	CBBT3	None	-	-	1	**1**
Chesapeake Bay	B11	None	-	-	1	**1**
Chesapeake Bay	B9	None	-	1	-	**1**
Chesapeake Bay	TS5	None	-	1	1	**2**
Chesapeake Bay	10 off c. char.	None	1	-	-	**1**
Chesapeake Bay	LC1	Little Creek	-	1	3	**4**
Chesapeake Bay	TS11	Little Creek	-	-	4	**4**
Chesapeake Bay	LC2	Little Creek	1	2	6	**9**
Chesapeake Bay	TS9	Little Creek	-	1	1	**2**
Chesapeake Bay	TS7	Little Creek	-	1	1	**2**
Chesapeake Bay	CBBT4	Little Creek	-	-	1	**1**
Chesapeake Bay	CBBT5	Little Creek	1	1	3	**5**
Chesapeake Bay	TS3	Fort Story	-	-	3	**3**
Chesapeake Bay	2CH off hen.	Fort Story	-	1	1	**2**
Chesapeake Bay	TS1	Fort Story	-	1	3	**4**

Table 11: Cont.

Region	Receiver	Military Zone	Green	Kemp's ridley	Loggerhead	Total individuals
Atlantic Ocean	CB	F. Range S.	-	-	1	**1**
Atlantic Ocean	CB9	F. Range S.	-	2	-	**2**
Atlantic Ocean	NCC	F. Range S.	1	-	-	**1**
Atlantic Ocean	CB11	F. Range S.	-	-	1	**1**
Atlantic Ocean	CB13	F. Range S.	-	1	-	**1**
Atlantic Ocean	NCD	F. Range S.	1	-	1	**2**
Atlantic Ocean	CH	F. Range S.	-	1	1	**2**
Atlantic Ocean	RI2	F. Range S.	2	5	1	**8**
Atlantic Ocean	RI	F. Range S.	-	-	3	**3**
Atlantic Ocean	RRI	F. Range S.	1	2	1	**4**
Atlantic Ocean	CH1	F. Range S.	-	-	1	**1**

C

Details of Turtles Included in this Project

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Details of turtles included in this project SCL NT is the straight carapace length notch to tip.

Field Number	Species	Turtle source	SCL NT (cm)	Date released	Known dead	Acoustic tag
VAQS20122171	Green	stranding	35.8	11-Jul-13	21-Jul-13	A69-1601-9888
VAQS20122185	Green	stranding	37.1	11-Jul-13		A69-1601-9890
VAQS20122180	Kemp's ridley	stranding	39.7	27-Aug-13		A69-1601-11895
VAQS20122163	Loggerhead	stranding	66.5	27-Aug-13		A69-1601-11901
VAQR2013015	Loggerhead	pound net	79.6	07-Sep-13		A69-1601-11908
VAQR2013018	Loggerhead	pound net	55.4	12-Sep-13	2-Oct-13	A69-1601-11907
VAQR2013019	Loggerhead	pound net	59.8	16-Sep-13	26-Sep-13	A69-1601-11904
VAQR2013013	Loggerhead	enclosure	63.8	19-Sep-13	23-Oct-13	A69-1601-11898
VAQS20132106	Loggerhead	stranding	70.4	28-Sep-13		A69-1601-11909
NAIB1240CC	Loggerhead	stranding		20-Oct-13		A69-1601-11905
VAQS20132086	Loggerhead	stranding	56.9	20-Oct-13	8-Nov-14	A69-1601-9086
VAQS20132102	Loggerhead	stranding	62.3	20-Oct-13		A69-1601-9084
VAQS20132126	Loggerhead	stranding	66.5	20-Oct-13		A69-1601-11906
VAQS20132141	Loggerhead	stranding	74.8	24-Nov-13		A69-1601-11900
VAQS20132129	Kemp's ridley	stranding	27.7	22-May-14		A69-1601-9889
VAQR2014001	Loggerhead	dip net	79.1	04-Jun-14		A69-1601-11897
VAQS20132172	Loggerhead	stranding	72.7	12-Jun-14		A69-1601-24792
VAQS20132225	Loggerhead	stranding	73.6	12-Jun-14		A69-1601-9087
VAQS20132219	Loggerhead	stranding	60.4	13-Jun-14		A69-1601-17229
1321Lk	Kemp's ridley	stranding		21-Jun-14		A69-1601-17233
1338Lk	Kemp's ridley	stranding		21-Jun-14		A69-1601-17228
1323Lk	Kemp's ridley	stranding		21-Jun-14		A69-1601-17232
VAQS20132220	Green	stranding	35.2	22-Jun-14		A69-1601-17226
VAQS20132230	Kemp's ridley	stranding	28.4	22-Jun-14	25-Jun-14	A69-1601-17224
VAQS20142090	Kemp's ridley	stranding	21.8	22-Jun-14		A69-1601-11894
VAQS20142016	Kemp's ridley	stranding	50.4	22-Jun-14		A69-1601-24787
VAQS20142104	Kemp's ridley	stranding	24.7	22-Jun-14	29-Jun-14	A69-1601-11899
VAQS20142111	Loggerhead	stranding	61.5	02-Jul-14		A69-1601-9077
VAQS20142128	Kemp's ridley	stranding	26	02-Jul-14		A69-1601-17227A

Details of turtles included in this project (cont.)

Field Number	Species	Turtle source	SCL NT (cm)	Date released	Known dead	Acoustic tag
VAQS20142128	Kemp's ridley	stranding	26	02-Jul-14		A69-1601-17227B
VAQS20132229	Kemp's ridley	stranding	35.6	09-Jul-14		A69-1601-24793
VAQS20142139	Kemp's ridley	stranding	28.4	17-Jul-14		A69-1601-17231
VAQS20142138	Green	stranding	33.4	18-Aug-14		A69-1601-24786
VAQS20142080	Kemp's ridley	stranding	28.7	18-Aug-14		A69-1601-17225
VAQS20142128	Kemp's ridley	stranding	26.4	18-Aug-14		A69-1601-17227
VAQS20142152	Kemp's ridley	stranding	35.4	02-Sep-14		A69-1601-17230
VAQS20132052	Loggerhead	stranding	67.3	05-Sep-14		A69-1601-24784
VAQS20132227	Kemp's ridley	stranding		20-Oct-14		A69-1601-24791
VAQS20142147	Loggerhead	stranding	61.3	20-Oct-14		A69-1601-24790

Details of turtles included in this project (cont.)

		Acoustic tag detections					Satellite tags	
Field Number	Species	Total detect.	# days	Days post-release	# Navy receivers	Other detect.	PTT	Days post-release
VAQS20122171	Green	0	0	NA	NA		N	
VAQS20122185	Green	23	2	1	3		N	
VAQS20122180	Kemp's ridley	15	1	5	3		N	
VAQS20122163	Loggerhead	382	7	12	15		108053	375
VAQR2013015	Loggerhead	826	13	53	9		117175	347
VAQR2013018	Loggerhead	5	1	11	2		117173	8
VAQR2013019	Loggerhead	19	2	8	4		132362	2
VAQR2013013	Loggerhead	7	2	0	2		117177	32
VAQS20132106	Loggerhead	393	10	29	5		132363	346
NAIB1240CC	Loggerhead	28	1	156	0	FL	132364	182
VAQS20132086	Loggerhead	14	1	193	0	SC	132365	251
VAQS20132102	Loggerhead	301	9	230	11		132366	188
VAQS20132126	Loggerhead	0	0	NA	NA		118913	211
VAQS20132141	Loggerhead	0	0	NA	NA		132368	229
VAQS20132129	Kemp's ridley	1	1	38	1		N	
VAQR2014001	Loggerhead	13	1	0	1		132363	137
VAQS20132172	Loggerhead	2	1	265	1		108055	166
VAQS20132225	Loggerhead	0	0	NA	NA		120347	197
VAQS20132219	Loggerhead	19	4	66	3	VA	138112	166
1321Lk	Kemp's ridley	1	0	NA	NA		N	
1338Lk	Kemp's ridley	0	0	NA	NA		N	
1323Lk	Kemp's ridley	7	1	76	0	MD	N	
VAQS20132220	Green	196	17	96	15	VA	N	
VAQS20132230	Kemp's ridley	0	0	NA	NA		N	
VAQS20142090	Kemp's ridley	0	0	NA	NA		N	
VAQS20142016	Kemp's ridley	63	2	8	5		N	
VAQS20142104	Kemp's ridley	25	5	8	5		N	
VAQS20142111	Loggerhead	1516	27	100	7		N	
VAQS20142128	Kemp's ridley	6	2	3	3		N	

Details of turtles included in this project (cont.)

		Acoustic tag detections					Satellite tags	
Field Number	Species	Total detect.	# days	Days post-release	# Navy receivers	Other detect.	PTT	Days post-release
VAQS20142128	Kemp's ridley	6	2	3	3		N	
VAQS20132229	Kemp's ridley	250	5	11	12		132367	37
VAQS20142139	Kemp's ridley	4	2	5	2		N	
VAQS20142138	Green	631	12	63	3		N	
VAQS20142080	Kemp's ridley	56	2	4	2		N	
VAQS20142128	Kemp's ridley	17	2	27	2		N	
VAQS20142152	Kemp's ridley	266	10	45	5		138117	38
VAQS20132052	Loggerhead	4	2	6	2		138118	38
VAQS20132227	Kemp's ridley	0	0	NA	NA		138114	48
VAQS20142147	Loggerhead	0	0	NA	NA		120346	active