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# Virginia Sea Turtle and Marine Mammal Stranding Network 2014 Grant Report

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VIRGINIA
AQUARIUM
STRANDING RESPONSE

Virginia Coastal Zone
MANAGEMENT PROGRAM

*VIRGINIA AQUARIUM FOUNDATION*
*STRANDING RESPONSE PROGRAM*

# *Virginia Sea Turtle and Marine Mammal Stranding Network 2014 Grant Report*

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**A Final Report to the**
**Virginia Coastal Zone Management Program**
**Department of Environmental Quality**
**Commonwealth of Virginia**
NOAA Grant #NA13NOS4190135, Task #49

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The mission of the Virginia Aquarium & Marine Science Center is to inspire conservation of the marine environment through education, research and sustainable practices. The Aquarium is operated by the City of Virginia Beach in cooperation with the Virginia Aquarium Foundation (VAQF) and the Commonwealth of Virginia.

The Virginia Aquarium Research & Conservation Section is responsible for directing the organization's efforts in these areas. With primary support from the VAQF, the Section's Stranding Repsonse Program is dedicated to conservation of marine animal species through stranding response, research, rehabilitation and education.

Virginia Coastal Zone
MANAGEMENT PROGRAM

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NOAA
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U.S. DEPARTMENT OF COMMERCE

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## INTRODUCTION

All marine mammals and sea turtles are designated as protected species by the Marine Mammal Protection Act (1972) and/or the Endangered Species Act (1973). The Virginia Aquarium & Marine Science Center Foundation Stranding Response Program (VAQS) holds permits from state and federal authorities for all activities in this report related to marine mammal and sea turtle stranding response and research. VAQS has been responding to marine mammal and sea turtle strandings (more than 6,100) in Virginia since 1987. The Aquarium and the VAQS Stranding Center are located in Virginia Beach, VA. VAQS responds to all marine mammal strandings in Virginia and currently maintains the state marine mammal stranding database. In addition, VAQS and their cooperators coordinate the Virginia Sea Turtle Stranding and Salvage Network throughout Virginia. All sea turtle stranding data are recorded by VAQS into the state sea turtle stranding database.

VAQS uses staff, volunteers and other organizations (cooperators) to report, record, document, examine and recover stranded animals. The organization and training of primary response cooperators is crucial to the stranding network. Rapid response to strandings can result in the rescue of live animals and the collection of valuable data that may otherwise be lost due to decomposition and/or scavenging. Formed in 1991, the VAQS Stranding Response Team (Team) is composed of staff and volunteers trained to respond to stranded animals. VAQS staff provides training programs for approximately 65 Team volunteers and personnel from cooperating agencies and organizations. Instruction in biology, ecology and both live and dead stranding response protocols are provided for marine mammal and sea turtle species found in Virginia. These cooperative training efforts have included the U.S. Coast Guard, U.S. Fish and Wildlife Service, NOAA Fisheries Service (NMFS), The Nature Conservancy, Virginia Marine Resources Commission, Virginia Department of Game and Inland Fisheries, Virginia Institute of Marine Science (VIMS), state parks, national wildlife refuges, regional law enforcement authorities and lifeguards. As a result of these continuing efforts, VAQS continues to maintain and improve statewide marine animal stranding response.

Marine mammal groups found in Virginia include cetaceans (dolphins, porpoises and whales), pinnipeds (seals) and sirenians (manatees). Marine mammal strandings occur in all months of the year. During the 1990s, Virginia averaged 63 marine mammal strandings per year with a high of 106 in 1994. Since then, stranding numbers have increased dramatically. For the years 2000-2012, Virginia averaged 100 marine mammal strandings per year. This could represent increasing marine mammal mortality, though it also may partially be the result of an improved state-wide stranding response network. The years since 2000 have continued with high numbers of marine mammal strandings in Virginia, culminating in the historic total from 2013 (427 strandings) that included a bottlenose dolphin unusual mortality event.

It is important for organizations such as VAQS to examine stranded marine mammals because these species are very difficult to study in the wild. Little is known about the natural history of many marine mammal species and strandings provide a rare opportunity to thoroughly examine these animals. With the advent of new techniques such as molecular genetic analyses, stranded animals provide a wealth of information about wild populations that are difficult and very costly to study in situ. In some species, such as pygmy/dwarf sperm whales and beaked whales, data collected from stranded animals provides the best information available on the species' natural history. Stranding records can indicate seasonal trends in presence and suggest areas of high concentration of marine mammal species such as bottlenose dolphins and harbor porpoises (Read and Murray, 2000). Spatial and temporal trends in marine mammal mortalities, such as those caused by unusual mortality events and/or fisheries interactions, can also be monitored from stranding records. Each stranded marine mammal is thoroughly

examined, whenever possible, including body measurements, external appearance and internal condition (via necropsy). Data and tissues are collected for life history, histology, bacteriology, virology and toxicology studies. Samples are collected by VAQS and have been supplied to the Smithsonian Institution, Armed Forces Institute of Pathology, NMFS, and numerous other research organizations.

In addition to dead strandings, the VAQS Team responds to live marine mammals each year. The level of response depends on the type of animal. Sick or injured baleen whales and toothed whales larger than 10 feet in length are virtually impossible for VAQS to rescue and often must be humanely euthanized. Some smaller cetaceans can be rescued if found quickly and in suitable condition. They must be supported in water as soon as possible and treated for shock. Successful cetacean rehabilitation requires large tanks, experienced personnel and access to sophisticated equipment. Currently, VAQS is not equipped to attempt long-term rehabilitation of a cetacean. As soon as possible, animals that are good candidates for rehabilitation are transferred to other facilities. Pinnipeds (seals), on the other hand, are amphibious animals and can be transported in dry containers such as canine kennels. The VAQS Stranding Center has a seal holding pen adequate for short-term triage and a seal rehabilitation unit capable of holding one animal. Seals in triage can be held in a 4'x 4' dry pen with gated entry into a 4'x 4' pool. Following triage, animals are placed in a seal rehabilitation area (large enough for one animal) or are transferred to other facilities in the stranding network that specialize in long-term rehabilitation and release of pinnipeds. Since 2000, VAQS has responded to an average of 6.0 cetaceans and 3.8 pinniped live strandings in Virginia each year. The VAQS Team also responds to live marine mammal emergencies in northeastern North Carolina (6.5 per year since 2000).

Five species of sea turtles (loggerhead, Kemp's ridley, leatherback, green, and hawksbill) are found in Virginia. Sea turtle strandings occur primarily in the late spring, summer and fall. The VAQS Team responded to an average of 86 sea turtle strandings per year during the 1990s. Since then, strandings have increased dramatically. Since 2000, Virginia has recorded more than 4,100 sea turtle strandings, with an average of 224 per year for the last ten years 2005-2014 (Fig. 6). Sea turtles are examined in much the same way as marine mammals. Data are recorded for all strandings, and necropsies are performed on many fresh stranded carcasses. Stranding trends, including probable causes of mortalities, are monitored through stranding records. Stranded sea turtles are checked for flipper and PIT tags and results are reported to NMFS. A small number of sea turtles nest on Virginia beaches each year, primarily loggerheads. In addition, several green and Kemp's ridley sea turtles have been recorded nesting recently in Virginia. The VAQS Team participates in a nesting beach monitoring program with the Back Bay National Wildlife Refuge and the Virginia Department of Game and Inland Fisheries (VDGIF). Live strandings of sea turtles have also increased and the VAQS Team has successfully rehabilitated and released many of the stranded turtles. Since 2000, an average of 10.0 live sea turtles have stranded in Virginia each year. In addition, VAQS Team expertise in sea turtle rehabilitation has resulted in many turtles (more than 60) that have stranded outside Virginia being transferred to VAQS for rehabilitation and release.

In addition to stranding response, VAQS conducts research on marine mammals and sea turtles. Photo-identification is a non-invasive technique that takes advantage of naturally occurring marks on animals. Photo-ID is used to study both bottlenose dolphins and large whales, primarily humpback whales, in the nearshore waters of Virginia and North Carolina. VAQS has also been conducting research on loggerhead sea turtles since 1990. Early research involved the study of growth potentials of loggerhead hatchlings in controlled environments. Post-release satellite tracking of aquarium-reared loggerheads was conducted with the help of VIMS in the 1990s. Growth and nutritional studies continue with hatchling loggerheads and non-releasable loggerheads, Kemp's ridleys and greens. With the support of additional grants

and donations in recent years, VAQS has been able to conduct numerous satellite tagging projects with yearling loggerheads and rehabilitated sea turtles.

VAQS Team staff and volunteers present the results of their research at national and regional workshops, at professional meetings and in numerous publications (Appendix I). In addition, VAQS research has been presented to more than 14 million people through innovative Aquarium exhibits and public programs. Staff and volunteers present educational programs related to stranding events, on-going stranding response and research throughout the year. On a continual basis, staff provide training/assistance and gain valuable experience in live animal rehab by visiting and working with staff at other facilities. VAQS staff also serves on federal management and scientific teams studying the interactions of protected species with commercial fisheries and other potentially threatening human activities. They regularly use their expertise and data to comment on projects that may have an impact on regional marine mammal and sea turtle populations, including a proposed naval undersea training range off Virginia's eastern shore, and possible offshore energy exploration and development. Finally, public and private organizations conducting natural resource surveys and environmental assessments routinely utilize the VAQS stranding database and expertise for information regarding protected species in Virginia.

## STRANDING RESPONSE METHODS

When examining dead stranded marine mammals and sea turtles, the VAQS Team follows data collection protocols developed by NMFS (Appendix IV). For marine mammals, Level A data are collected on all strandings and recorded in the marine mammal stranding database. Level A data include:

- observer
- species
- condition
- weight
- findings of human interaction *
- sample collection and dissemination
- disposition of carcass
- date
- location
- body length
- gender

(* Findings of human interaction consist of clues on a carcass that human activities were responsible for injuries and/or the death of the animal. The most common types of human interactions are fishery entanglements, vessel strikes and marine debris ingestion. In addition, special data collection protocols and forms have been developed by VAQS for assessing human interactions in marine mammal and sea turtle strandings).

Level B and C data are collected from fresh carcasses. Level B and C data are recorded on specialized data sheets and are often shared with other collaborating research organizations. These more involved data include:

- age
- extensive body measurements
- descriptions and photographs of external & internal appearance
- parasite and pathology occurrence
- stomach contents
- reproductive status
- genetic information
- tissue contaminant levels
- information for specific research

In order to provide timely, accurate and usable information, VAQS compiles these data in a database. The computer system, database and software allow for analytical study of the data including GIS mapping. When combined with the extensive VAQS photo and video catalogs, the marine mammal stranding database can be an invaluable tool for scientists, natural resource managers and other state and federal agencies.

Sea turtle data are collected in much the same manner as for marine mammals (Appendix IV). In addition to the Level A data listed above, the VAQS Team also examines sea turtle carcasses for several types of tags. PIT tags and wire tags require specialized equipment in order to be detected. Fresh turtles are examined for stomach contents, gender and findings of human interaction.

Live marine mammals and sea turtles have become an increasing part of stranding response for the VAQS Team. Live stranding response is quite different from responding to dead animals. While time is important when responding to a fresh dead stranding, timely response is crucial to the welfare and potential survival of live stranded animals. Once a live stranding is confirmed, staff and volunteers can be ready to respond in minutes. Cooperating agencies, especially on Virginia's eastern shore, have immensely improved the VAQS Team's ability to quickly respond to live strandings. Whenever possible, live stranded animals are rushed to the Stranding Center where they are immediately treated for shock and other obvious injuries. VAQS veterinary staff and live animal care manager have developed protocols and data sheets for live animal response and rehabilitation. VAQS staff has established an excellent working relationship with medical diagnostic service companies and with local vet clinics that provide valuable support services in the form of blood and sample analyses, radiograph support and doses of less common drugs. In addition, the medical team works with several specialized veterinarians and technicians, including eye specialists and advanced diagnostic technicians, on special cases. The VAQS Team is now experienced at working with live stranded sea turtles and seals and has gained valuable experience with live cetaceans. VAQS sea turtle rehabilitation experience was put into action during response to the BP Deepwater Horizon Oil Spill in the Gulf of Mexico in 2010 and the mass cold-stun event in the northeast in 2014. VAQS staff were deployed over a total period of more than six weeks to assist sea turtle recovery and rehabilitation efforts in Louisiana and Florida from the oil spill, and for more than six weeks in Massachusetts for the 2014 event.

## DISCUSSION OF 2014 VIRGINIA STRANDING DATA

### MARINE MAMMALS

Virginia stranding data are presented for the calendar year 2014. A total of 95 marine mammal strandings were recorded during 2014 (Table 1). This number was much lower than in 2013 when Virginia experienced the highest number of marine mammal strandings ever recorded in a single year (427). In the past ten years, the number of marine mammal strandings has varied between 119 (2005) and 75 (2012), not including the historic year of 2013 (Fig. 1). The unprecedented numbers of strandings in 2013 were caused by an unusual mortality event that affected coastal bottlenose dolphins from New York to Florida. Temporally, marine mammal strandings occur in all months of the year, but some marine mammals (i.e. bottlenose dolphins, harbor porpoises and seals) tend to strand seasonally, while others (i.e. large whales and other cetaceans) can occur at any time of the year (Fig. 2). Bottlenose dolphins comprise the majority of the marine mammals that strand each year, but the Virginia stranding database is very diverse and now includes 32 species (Appendix V). 2014 was a more typical year for bottlenose dolphin strandings and they comprised 75% of the strandings (Fig. 3). Spatially, marine mammal

strandings occur throughout Virginia's ocean and bay waters. Normally, strandings are most common along the eastern shore and southern shore of the Chesapeake Bay mouth and the southern ocean coast (Fig. 4). Pictures and descriptions of notable marine mammal strandings from 2014 are included in Appendix II.

Marine mammals are divided into five data groups for analyses. These data groups are: (1) bottlenose dolphin - the most common marine mammal in Virginia, (2) harbor porpoise - a common small cetacean that occurs in late winter and spring, (3) large whales - primarily baleen whales such as humpback, fin, right and minke whales, (4) other cetaceans - primarily oceanic species with low stranding rates such as pilot whales, pygmy and dwarf sperm whales, pelagic dolphins and beaked whales, and (5) pinnipeds - harbor, harp, hooded and gray seals. Live stranded animals are included in these analyses and are also addressed separately below.

***Live strandings***

In 2014, VAQS responded to 10 live marine mammal strandings in Virginia (Table 2). These strandings occurred at various times throughout the year and consisted of eight cetaceans and two pinnipeds. The cetaceans included three bottlenose dolphin, one common dolphin, two pygmy sperm whales, one harbor porpoise and one sei whale. All of the cetaceans that stranded either died on the beach or were humanely euthanized. The pinnipeds included one gray seal and one harp seal. One gray seal was rehabilitated and transported to the Mystic Aquarium in Mystic, CT for eventual release. The harp seal was in extremely poor condition and died on the beach prior to recovery.

***Bottlenose dolphin***

Bottlenose dolphins (*Tursiops truncatus*) are the most common marine mammals sighted in Virginia waters. They are also the most commonly stranded marine mammal in the state. Most bottlenose dolphins strand from April to October, which is concurrent with their seasonal appearance in Virginia coastal waters (Barco *et al*. 1999; Fig. 2). During 2014, 71 bottlenose dolphin strandings were recorded in Virginia (Fig. 5A). The UME that began in 2013 impacted bottlenose dolphins from New York to Florida and continued in 2014, though Virginia dolphin mortalities returned to pre-UME levels. Bottlenose dolphin strandings in 2014 occurred primarily along the Atlantic Ocean and lower Chesapeake Bay shorelines (Fig. 4). In 2014, 28.2% (20) of the strandings occurred in Virginia Beach, 33.8% (24) on the eastern shore, 8.5% (6) in Norfolk/Portsmouth and 29.5% (21) on the western shores of Chesapeake Bay north of the James River. Gender was determined for 47 of the stranded dolphins. Females comprised 40% (19) and males comprised 60% (28) of the known gender animals. Of the 53 stranded dolphins with recorded lengths (includes estimated lengths and observer descriptions), seven (13%) were less than 160 cm (defined as "young of the year", YOY), the approximate size of a one-year old dolphin (Fig. 5A; Urian *et al*. 1996). Past examination of YOY has revealed evidence of infanticide in the form of broken bones, hemorrhaging and organ damage (Dunn et al. 2002). Of the dolphins that were fresh to moderately decomposed (n = 36), signs of human interaction could not be determined in 26 (72%), were positive in five (14%), and were not observed in five (14%). Most of the signs of interactions were related to fisheries entanglements.

***Harbor porpoise***

Harbor porpoise (*Phocoena phocoena*) were observed only occasionally in Virginia stranding records during the 1980's. Increases in harbor porpoise strandings occurred along the

mid-Atlantic coast in 1993-1994 and the increases were most dramatic in Virginia (Cox *et al*. 1998, Swingle *et al*. 1995). In recent years, they have often been the second most commonly stranded marine mammals in Virginia. Harbor porpoises typically strand in late winter and early spring (Fig. 2), and strandings occur along the ocean shorelines (Fig. 4). During 1999, 40 harbor porpoise strandings were recorded in Virginia, but in 2000, that number dropped precipitously to only four. 2001 was another big year (30 strandings), followed by only six harbor porpoise strandings in 2002. Subsequent years have seen the numbers vary widely, from a high of 22 strandings in 2005, to a low of two strandings in 2011 and 2012. There were three harbor porpoise strandings in Virginia in 2014 (Fig. 5B). How these stranding patterns relate to fluctuations in abundance of the population or stocks, threats that are cyclical in nature (such as potential fisheries bycatch), or other factors, is constantly under review.

***Large whales***

Large whales do not strand often in Virginia. With the exception of the sperm whale, large whales are typically baleen whales such as humpbacks or fins. All of the large whales normally found in Virginia are endangered species. Because of the logistics involved in examinations of large whales, an extensive large whale response protocol was developed (Blaylock *et al*. 1996). The protocol was developed in response to increased strandings of humpback whales in Virginia and North Carolina in the early 1990's (Swingle *et al*. 1993, Barco *et al*. 2002). The response protocol has since been further developed and is specifically applied to northern right whales (McLellan *et al*. 2004). During 2008, there were no large whale strandings in Virginia. In 2014, VAQS responded to one fin whale (*Balaenoptera physalus*), one sei whale (*Balaenoptera borealis*) and one minke whale (*Balaenoptera acutorostrata*) in Virginia. Overall, there have been 2.5 large whale strandings annually in Virginia during the last ten years (Fig. 5C). In addition to strandings, VAQS also responds to large whale entanglements. VAQS staff has been qualified to respond to entangled whales by the Center for Coastal Studies in MA. Specialized whale disentanglement gear and supplies are stored at the VAQS Stranding Center for use in the mid-Atlantic region. This equipment and training were essential in the successful disentanglement of a humpback whale in the waters off Virginia Beach in 2007.

***Other cetaceans***

"Other cetacean" species generally include pelagic delphinids, *Kogia* species and beaked whales. This group accounted for 14 strandings during 2014. These strandings typically occur along the ocean and lower bay shorelines and sometimes involve live animals. In 2014, there were nine common dolphins (*Delphinus delphis*), one Risso's dolphin (*Grampus griseus*) one dwarf sperm whale (*Kogia sima*), two pygmy sperm whales (*Kogia breviceps*) and one Blainville's beaked whale (*Mesoplodon densirostris*). One common dolphin and the two pygmy sperm whales stranded alive, though all were euthanized in the field due to their poor conditions and prognosis for recovery.

***Pinnipeds***

Pinniped strandings have generally increased in Virginia since the early 1990s and there were four strandings recorded from Virginia during 2014 (Fig. 3, 5D). The species included two harbor seals (*Phoca vitulina*), one gray seal (*Halichoerus grypus*) and one harp seal (*Pagophilus groenlandica*). The gray seal and the harp seal stranded alive. The gray seal was recovered, rehabilitated by VAQS and then transferred to Mystic Aquarium for further rehabilitation and

release. The harp seal died on the beach prior to recovery.

Regular sightings of seals in Virginia continue to be common occurrences in winter and early spring. Improved education and training of stranding network personnel have decreased the unwarranted captures of otherwise healthy seals which have hauled-out to rest on Virginia shorelines, piers, jetties and rock islands.

## SEA TURTLES

During 2014, there was another significant number of sea turtle strandings (248) in Virginia (Table 3). Since 2000, Virginia has experienced both extremely high (531 in 2003) and relatively low (173 in 2011) numbers of sea turtle strandings. With an average of 224 annually in the last ten years, Virginia remains an area of high sea turtle mortality as measured by strandings (Fig. 6). The VAQS Team responded to 221 sea turtle strandings during the year and an additional 27 strandings were reported by stranding network cooperators trained by VAQS (Table 3). June was the busiest month with 100 strandings (40%), followed by May, July, October with August with 29 (12%), 25 (10%), 24 (10%) and 23 (9%) strandings, respectively. There were also significant numbers of strandings in the months of September and November, as well (Fig. 7). Loggerheads (*Caretta caretta*, n = 146) were the primary species recorded, followed by Kemp's ridleys (*Lepidochelys kempii*, n = 78), greens (*Chelonia mydas*, n = 12), leatherbacks (*Dermochelys coriacea*, n = 2) and 10 sea turtles that were unidentified to species (Fig. 8). The distribution of strandings was primarily along the ocean and lower bay shorelines (Fig. 9). The eastern shore of Virginia was the area where 28% (70) of the sea turtle strandings were found. Accomack County accounted for 23% (16) and Northampton County for 77% (54) of the eastern shore total. Strandings in Virginia Beach, Norfolk and other southside cities contributed to 50% (123) of the total. The remainder 22% (34) originated from the western shores of the Chesapeake Bay north of the James River.

Improved efforts by VAQS to recruit and train cooperators have greatly enhanced stranding response on the eastern shore. Externally, a number of dead stranded turtles appeared to have been hit by vessels. In some cases, the carcasses were fresh enough to conduct thorough necropsies. Necropsies on stranded turtles sometimes reveal signs of human interaction in the form of fish lures, hooks, line and plastic debris in the gut. The fishing equipment could be from recreational or commercial (long-line) gear and may have been actively fishing or was "ghost" gear. Further understanding the impacts that recreational and commercial fishing have on turtles is needed. Lastly, the VAQS Team participated in several research projects with NMFS and USFWS. Flippers were collected from sea turtles for studies on aging, and skin and muscle samples were collected for genetic studies. Live turtles rehabilitated by VAQS were used in tracking studies of post-release movements. Pictures of some of the notable sea turtle strandings in 2014 are included in Appendix III.

### *Live strandings*

2014 was a very busy year for the VAQS Team with 31 live sea turtle strandings recorded from Virginia – seven loggerheads, 16 Kemp's ridleys, two greens and six unidentified to species. Seventeen of these turtles were successfully recovered, rehabilitated and released and nine were disentangled and/or released from commercial and recreational fishing gear. Nine sea turtles that stranded in 2013 were also released during 2014. In addition, 10 sea turtles (from the New England Aquarium in Massachusetts) were transferred to VAQS for rehabilitation in 2014 following a record-setting cold-stunning event in the northeast. Throughout the year, the VAQS Team spent many hours medicating and feeding sea turtles. Some of the sea turtles had stranded

in previous years and had been in rehabilitation for many months prior to release. When the year ended, there were 15 sea turtles in rehabilitation at the VAQS Stranding Center (Table 4).

**VAQS ACTIVITIES DURING 2014**

VAQS conducted trainings on biology, ecology and stranding response protocols for sea turtles and marine mammals during the year. Trainings were provided to Virginia Aquarium Outreach Instructors, VAQS Team volunteers and to other cooperators in the state stranding network including: Back Bay National Wildlife Refuge, Eastern Shore National Wildlife Refuge, Chincoteague National Wildlife Refuge; Kiptopeke and False Cape State Parks; Virginia Beach police, animal control and beach maintenance personnel; U.S. Coast Guard; Dam Neck and other military base natural resources personnel; personnel from VMRC and VDGIF; The Nature Conservancy and other natural resources groups. In addition, lectures were presented on the topics of marine mammal and sea turtle necropsies, new findings from sea turtle and marine mammal research, the bottlenose dolphin UME, and federal efforts to manage and protect marine mammals. VAQS staff attended numerous conferences and workshops and shared knowledge of sea turtle and marine mammal strandings in Virginia. Educational programs were presented at many local and regional festivals, to school groups and civic organizations as well as during special Aquarium events. A portable exhibit and group of outreach volunteers presented the activities of the VAQS and the Virginia stranding network, and promoted conservation of marine animal species and their habitats. A complete list of all professional, education and training activities is included in Appendix I of this report.

Grant funds were used in conjunction with funds from the Virginia Aquarium Foundation to staff the Aquarium's Marine Animal Care Center with a full-time stranding response manager, a live animal care manager, three full-time stranding response technicians, and two hourly stranding assistants. Aquarium research staff also assisted with stranding response as needed and in support of research projects. The VAQS Team completed another calendar year using an on-call system developed to ensure that volunteers were available for stranding response, seven days per week, for the entire year. Created and managed by volunteer team response leaders, the on-call system greatly enhances the Team's readiness and rapid response. VAQS Team volunteers logged more than 15,500 hours during 2014.

VAQS continued several research projects that have been ongoing for many years. Photo-identification research on bottlenose dolphins continued for the 24th year. The photo-ID catalog contains more than 1250 individual dolphins, some of which are regular visitors to Virginia and have been observed in multiple years. VAQS continued to curate the Mid-Atlantic Humpback Whale Photo-Identification Catalog. Results of matching efforts between the mid-Atlantic catalog and others from the western North Atlantic continues to result in new data about the origin of many whales observed in Virginia (Barco *et al*. 2002). The catalog contains images from stranded and live whales observed in coastal waters from New Jersey through North Carolina. VAQS staff continues to conduct advanced necropsies on fresh-dead sea turtles to investigate causes of mortalities and to determine baseline health information for regional populations. Sea turtle and marine mammal diet studies continued in 2014 as part of grant funded projects. Sea turtle and marine mammal population assessment studies were also conducted in Virginia waters, including both aerial surveys and satellite and acoustic tracking of individual sea turtles. Finally, nutritional and growth studies continued with sea turtles in the Virginia Aquarium's long-term and short-term collections.

**SUMMARY**

Data collected by VAQS and the Virginia stranding network continue to be critical to the long-term monitoring efforts for sea turtle and marine mammal populations in the mid-Atlantic region. Fresh-stranded cetaceans continue to be extensively sampled as part of cooperative research (involving the University of North Carolina at Wilmington, Duke University and the North Carolina State University Vet School) to better assess marine mammal health. These studies are crucial to developing a better understanding of the overall health status of marine mammal populations in the wild. Stranding response and data collection from Virginia were crucial to the identification and evaluation of the bottlenose dolphin UME that began in July 2013 along the east coast. Virginia also experienced the highest number of dolphin mortalities (345) associated with the UME. Studies associated with the vast amount of data and samples collected will continue to help researchers better understand the impact of these mortalities on coastal bottlenose dolphin stocks. In addition, the unprecedented levels of mortalities have also provided a wealth of potential data for further understanding the life history of these iconic regional marine mammals. Marine mammal strandings, particularly bottlenose dolphins, remain very high and a significant percentage of the mortalities are related to human activities such as commercial fishing. For this reason, VAQS staff serves as expert members on three federal Take Reduction Teams working to reduce the incidental mortalities of marine mammals in commercial fishing operations. The recently enacted changes to the rules regulating pound net leaders, supported by VAQS research efforts, are reducing the incidental takes of dolphins and sea turtles in Chesapeake Bay.

Sea turtle strandings increased significantly in 2012, 2013 and 2014 following several years of reduced numbers in 2010 and 2011. Monitoring Virginia sea turtle strandings in 2015 should continue to provide valuable information to help understand the causes of sea turtle mortalities and if the increasing numbers represent a significant trend, or only a temporary change. The VAQS continues to work closely to monitor and investigate the high rates of sea turtle strandings on Virginia's eastern shore.

Data collected from strandings provides excellent information on life histories of the many species of marine mammals and sea turtles that inhabit Virginia waters. Stranded animals are the only source of this type of scientific information for most species of marine mammals. The sei whale and True's beaked whale strandings in 2003, the melonheaded whale strandings in 2008, the Sowerby's beaked whale strandings in 2009 and the pygmy killer whale strandings in 2013 provide excellent examples of the unique opportunities that strandings provide to study rare and previously unknown species from Virginia.

The VAQS Stranding Center has increased its role in the response, rescue and rehabilitation of sea turtles and seals. The high level of live stranding responses continued in 2014, and the need for a fully functional response and rehabilitation facility is clear. VAQS is planning to continue its efforts on behalf of live stranded sea turtles and marine mammals in Virginia and northeastern North Carolina and plans are being developed for a larger and better-equipped marine animal care facility. This project was formally initiated with the architectural design and development phase in late 2014 and is expected to be completed in 2018.

Marine mammal and sea turtle strandings in Virginia were once again at high levels during 2014. As a result, managing the Virginia stranding networks for these federally and state protected species continues to be a priority for VAQS and is vitally important for the state and federal agencies who depend on this information. At the same time, federal funding from NOAA Fisheries for the marine mammal stranding network through the Prescott Stranding Grant Program continues to be reduced and is constantly under threat of elimination. It is possible that this Program will disappear unless Congress acts to reinstate the only federal funding available to

the national marine mammal stranding network. At a time when marine mammal strandings are at record levels, and stranding data are crucial to monitoring ocean health and supporting fishery management and ocean resource-use planning efforts, stranding network organizations like VAQS are trying to operate with declining federal financial support. There remains much work to do and it is hoped that management efforts informed by quality stranding data will begin to reduce the high levels of sea turtle and marine mammal mortalities in Virginia and elsewhere in the region. Continued monitoring and reporting of trends in strandings of protected species will be priorities for the Virginia stranding network in 2015.

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Table 1: Marine mammal strandings in Virginia during 2014, n=95.
(Data from the VAQS Marine Mammal Stranding Database)
[Length=cm; * indicates estimated length; ND=no data; U=unknown]

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20141001 | 1/5/2014 | common dolphin | Accomack | 37.8684 | -75.3624 | dead | M | 221.2 |
| VAQS20141002 | 2/19/2014 | fin whale | Accomack | 37.8937 | -75.8922 | dead | F | 1320.0* |
| VAQS20141003 | 2/26/2014 | harbor porpoise | Virginia Beach | 36.9268 | -76.0038 | alive | M | 112.2 |
| VAQS20141004 | 2/28/2014 | common dolphin | Virginia Beach | 36.9115 | -76.1033 | dead | M | 214.6 |
| VAQS20141005 | 3/2/2014 | harbor porpoise | Virginia Beach | 36.5795 | -75.8736 | dead | F | 106.2 |
| VAQS20141006 | 3/9/2014 | common dolphin | Accomack | 37.8568 | -75.3878 | dead | M | 238.4 |
| VAQS20141007 | 3/9/2014 | harp seal | Accomack | 37.8686 | -75.3619 | alive | F | 110.0 |
| VAQS20141008 | 3/15/2014 | harbor seal | Accomack | 37.7747 | -75.5372 | dead | F | 140.3 |
| VAQS20141009 | 3/19/2014 | gray seal | Virginia Beach | 36.7573 | -75.9478 | alive | F | 84.0* |
| VAQS20141010 | 3/26/2014 | common dolphin | Virginia Beach | 36.9314 | -76.0361 | dead | M | 229.5 |
| VAQS20141011 | 3/29/2014 | harbor porpoise | Virginia Beach | 36.8726 | -75.9799 | dead | F | 115.2 |
| VAQS20141012 | 4/2/2014 | bottlenose dolphin | Northampton | 37.4514 | -75.9697 | dead | F | 211.0 |
| VAQS20141013 | 4/2/2014 | bottlenose dolphin | Accomack | 37.7549 | -75.5475 | dead | U | 259.0 |
| VAQS20141014 | 4/11/2014 | bottlenose dolphin | York | 37.1993 | -76.3943 | dead | F | 211.0* |
| VAQS20141015 | 4/16/2014 | bottlenose dolphin | Portsmouth | 36.8697 | -76.3485 | dead | M | 257.2 |
| VAQS20141016 | 4/16/2014 | bottlenose dolphin | Virginia Beach | 36.6141 | -75.8841 | dead | M | 210.0* |
| VAQS20141017 | 4/19/2014 | common dolphin | Virginia Beach | 36.6209 | -75.8863 | alive | F | 187.0 |
| VAQS20141018 | 4/22/2014 | bottlenose dolphin | Accomack | 37.8509 | -75.3841 | dead | M | 194.4 |
| VAQS20141019 | 4/27/2014 | bottlenose dolphin | Virginia Beach | 36.8733 | -75.9804 | dead | M | 294.1 |
| VAQS20141020 | 4/27/2014 | bottlenose dolphin | Northumberland | 37.7947 | -76.3142 | dead | F | 255.6 |
| VAQS20141021 | 5/3/2014 | common dolphin | Northampton | 37.0955 | -75.9405 | dead | M | 201.0 |
| VAQS20141022 | 5/3/2014 | bottlenose dolphin | Northampton | 37.0932 | -75.9406 | dead | M | 179.0* |
| VAQS20141023 | 5/6/2014 | common dolphin | Northampton | 37.2126 | -75.8186 | dead | U | 189.0 |
| VAQS20141024 | 5/7/2014 | common dolphin | Accomack | 37.8573 | -75.4615 | dead | U | ND |
| VAQS20141025 | 5/7/2014 | harbor seal | Accomack | 37.6854 | -75.5891 | dead | F | 100.9 |
| VAQS20141026 | 5/12/2014 | bottlenose dolphin | Northampton | 37.2397 | -76.0168 | dead | M | 192.2 |
| VAQS20141027 | 5/12/2014 | bottlenose dolphin | Accomack | 37.8917 | -75.3568 | dead | M | 214.2 |
| VAQS20141028 | 5/13/2014 | bottlenose dolphin | Northampton | 37.4290 | -75.9810 | dead | M | 104.2 |
| VAQS20141035 | 5/13/2014 | bottlenose dolphin | Northampton | 37.1923 | -75.8197 | dead | U | 226.0 |
| VAQS20141029 | 5/18/2014 | bottlenose dolphin | Northampton | 37.0972 | -75.9803 | dead | M | 188.4 |
| VAQS20141030 | 5/20/2014 | bottlenose dolphin | Northampton | 37.1689 | -75.9875 | dead | M | 200.0 |
| VAQS20141031 | 5/21/2014 | bottlenose dolphin | Northampton | 37.3770 | -75.9891 | dead | F | 201.0 |
| VAQS20141032 | 5/22/2014 | bottlenose dolphin | Lancaster | 37.6612 | -76.3358 | dead | U | ND |
| VAQS20141033 | 5/24/2014 | bottlenose dolphin | Virginia Beach | 36.9141 | -76.0711 | dead | F | 99.0 |
| VAQS20141034 | 5/25/2014 | Blainville's beaked whale | Northampton | 37.1060 | -75.9494 | dead | M | 397.0 |
| VAQS20141036 | 5/25/2014 | bottlenose dolphin | Northampton | 37.1925 | -75.8193 | dead | M | 278.0 |
| VAQS20141037 | 5/26/2014 | bottlenose dolphin | Northampton | 37.4257 | -75.9820 | dead | F | 173.0 |
| VAQS20141038 | 5/27/2014 | Risso's dolphin | Accomack | 37.8381 | -75.4820 | dead | F | 194.0 |
| VAQS20141039 | 5/27/2014 | bottlenose dolphin | Northampton | 37.1879 | -75.9982 | dead | M | ND |
| VAQS20141040 | 5/29/2014 | bottlenose dolphin | Virginia Beach | 36.7766 | -75.9548 | dead | F | 243.4 |
| VAQS20141041 | 5/31/2014 | bottlenose dolphin | Virginia Beach | 36.7640 | -75.9500 | dead | F | 100.0 |
| VAQS20141042 | 5/31/2014 | bottlenose dolphin | Norfolk | 36.9364 | -76.2128 | dead | M | 276.0 |
| VAQS20141043 | 6/1/2014 | bottlenose dolphin | Norfolk | 36.9484 | -76.2402 | dead | M | 295.0* |
| VAQS20141054 | 6/1/2014 | bottlenose dolphin | Accomack | 37.6430 | -75.8917 | dead | U | ND |
| VAQS20141044 | 6/2/2014 | bottlenose dolphin | Mathews | 37.3011 | -76.2776 | dead | U | ND |
| VAQS20141046 | 6/2/2014 | bottlenose dolphin | Northampton | 37.2780 | -75.7968 | dead | U | 145.0* |
| VAQS20141045 | 6/3/2014 | bottlenose dolphin | Northampton | 37.1266 | -75.8880 | dead | M | ND |
| VAQS20141047 | 6/3/2014 | bottlenose dolphin | Mathews | 37.3672 | -76.2565 | dead | F | 276.0 |
| VAQS20141048 | 6/3/2014 | bottlenose dolphin | Virginia Beach | 36.9222 | -76.1382 | dead | M | 217.0* |
| VAQS20141049 | 6/6/2014 | bottlenose dolphin | Northampton | 37.4560 | -75.6597 | dead | U | 295.0* |
| VAQS20141050 | 6/6/2014 | bottlenose dolphin | Hampton | 37.0073 | -76.3481 | dead | M | 180.0* |
| VAQS20141051 | 6/6/2014 | bottlenose dolphin | Northampton | 37.3858 | -75.7074 | dead | U | 264.0* |
| VAQS20141052 | 6/6/2014 | bottlenose dolphin | Northampton | 37.5124 | -75.6469 | dead | M | 193.8 |
| VAQS20141053 | 6/6/2014 | bottlenose dolphin | Lancaster | 37.6308 | -76.2886 | dead | M | 181.2 |
| VAQS20141055 | 6/12/2014 | bottlenose dolphin | Middlesex | 37.5489 | -76.3093 | dead | F | 105.6 |
| VAQS20141057 | 6/15/2014 | bottlenose dolphin | Accomack | 37.8464 | -75.9909 | dead | U | ND |
| VAQS20141056 | 6/17/2014 | bottlenose dolphin | Gloucester | 37.2596 | -76.4278 | dead | M | 228.0 |
| VAQS20141058 | 6/22/2014 | bottlenose dolphin | Hampton | 37.0024 | -76.3036 | dead | F | 211.0 |

Table 1: Marine mammal strandings *cont.*

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20141060 | 6/22/2014 | bottlenose dolphin | York | 37.1623 | -76.3710 | dead | M | 268.0 |
| VAQS20141061 | 6/27/2014 | bottlenose dolphin | Virginia Beach | 36.9297 | -76.0108 | dead | U | ND |
| VAQS20141059 | 6/29/2014 | bottlenose dolphin | Virginia Beach | 36.6956 | -75.9240 | dead | U | ND |
| VAQS20141062 | 6/29/2014 | bottlenose dolphin | Mathews | 37.5483 | -76.2825 | dead | M | 109.3 |
| VAQS20141063 | 7/7/2014 | bottlenose dolphin | Lancaster | 37.6154 | -76.2937 | dead | F | 198.4 |
| VAQS20141064 | 7/12/2014 | bottlenose dolphin | Norfolk | 36.9625 | -76.2638 | dead | U | 103.1 |
| VAQS20141065 | 7/12/2014 | bottlenose dolphin | Northumberland | 37.8387 | -76.2499 | dead | U | ND |
| VAQS20141066 | 7/17/2014 | bottlenose dolphin | Hampton | 36.9908 | -76.3854 | dead | F | 262.2 |
| VAQS20141067 | 7/18/2014 | bottlenose dolphin | Virginia Beach | 36.9144 | -76.1152 | dead | U | 270.2* |
| VAQS20141068 | 7/20/2014 | bottlenose dolphin | Newport News | 36.9407 | -76.4030 | alive | U | ND |
| VAQS20141069 | 7/25/2014 | bottlenose dolphin | Lancaster | 37.6423 | -76.3332 | dead | U | ND |
| VAQS20141070 | 7/29/2014 | bottlenose dolphin | Virginia Beach | 36.7165 | -75.9314 | dead | U | ND |
| VAQS20141071 | 8/2/2014 | dwarf sperm whale | Virginia Beach | 36.7287 | -75.9361 | dead | M | 116.1 |
| VAQS20141072 | 8/2/2014 | bottlenose dolphin | Northampton | 37.1801 | -75.9929 | dead | M | 205.0 |
| VAQS20141073 | 8/8/2014 | bottlenose dolphin | Hampton | 37.1135 | -76.2671 | dead | M | 178.0 |
| VAQS20141074 | 8/10/2014 | bottlenose dolphin | Middlesex | 37.6448 | -76.5632 | dead | F | ND |
| VAQS20141075 | 8/11/2014 | common dolphin | Northampton | 37.1144 | -75.9070 | dead | U | ND |
| VAQS20141076 | 8/13/2014 | bottlenose dolphin | Mathews | 37.3133 | -76.2800 | dead | U | ND |
| VAQS20141077 | 8/14/2014 | sei whale | Portsmouth | 36.9317 | -76.3783 | alive | F | 1397.0 |
| VAQS20141079 | 8/16/2014 | bottlenose dolphin | Virginia Beach | 36.8516 | -75.9738 | dead | U | ND |
| VAQS20141078 | 8/24/2014 | bottlenose dolphin | Mathews | 37.5153 | -76.2916 | dead | F | 131.8 |
| VAQS20141080 | 8/27/2014 | bottlenose dolphin | Virginia Beach | 36.9224 | -76.1388 | dead | M | 285.0* |
| VAQS20141081 | 8/31/2014 | bottlenose dolphin | Virginia Beach | 36.6783 | -75.9152 | dead | U | 260.0* |
| VAQS20141082 | 9/4/2014 | bottlenose dolphin | Northampton | 37.0832 | -75.9530 | dead | U | 270.0* |
| VAQS20141083 | 9/20/2014 | bottlenose dolphin | Virginia Beach | 36.7056 | -75.9276 | alive | F | 196.4 |
| VAQS20141084 | 9/27/2014 | bottlenose dolphin | Accomack | 37.8587 | -75.3929 | dead | F | 230.5 |
| VAQS20141085 | 9/28/2014 | bottlenose dolphin | Norfolk | 36.9310 | -76.1897 | dead | F | 208.0 |
| VAQS20141086 | 9/28/2014 | bottlenose dolphin | Virginia Beach | 36.9204 | -76.1212 | dead | F | ND |
| VAQS20141087 | 10/2/2014 | bottlenose dolphin | Virginia Beach | 36.9146 | -76.0679 | dead | M | 243.9 |
| VAQS20141088 | 10/17/2014 | bottlenose dolphin | Virginia Beach | 36.6380 | -75.8944 | dead | U | ND |
| VAQS20141089 | 10/20/2014 | bottlenose dolphin | Virginia Beach | 36.9147 | -76.0690 | alive | U | ND |
| VAQS20141090 | 11/1/2014 | bottlenose dolphin | Virginia Beach | 36.7802 | -75.9562 | dead | U | 250.6* |
| VAQS20141091 | 11/1/2014 | bottlenose dolphin | Norfolk | 36.9320 | -76.1960 | dead | M | 286.0 |
| VAQS20141092 | 11/11/2014 | bottlenose dolphin | Virginia Beach | 36.7190 | -75.9324 | dead | M | 256.6 |
| VAQS20141093 | 11/18/2014 | pygmy sperm whale | Virginia Beach | 36.9129 | -76.0792 | alive | M | 249.0 |
| VAQS20141094 | 12/1/2014 | pygmy sperm whale | Virginia Beach | 36.6913 | -75.9216 | alive | F | 236.9 |
| VAQS20141095 | 12/24/2014 | minke whale | Virginia Beach | 36.8040 | -75.9631 | dead | F | 430.0 |

Table 2: Live stranded marine mammals recorded by VAQS in 2014, n=10.

| Field Number | Species | Strand Date | State | Final Disposition |
|---|---|---|---|---|
| VAQS20141003 | harbor porpoise | 2/26/2014 | VA | euthanized 02/26/2014 |
| VAQS20141007 | harp seal | 3/9/2014 | VA | died 03/09/2014 |
| VAQS20141009 | gray seal | 3/19/2014 | VA | transferred to Mystic Aquarium, released 7/17/14 |
| VAQS20141017 | common dolphin | 4/19/2014 | VA | euthanized 04/19/2014 |
| VAQS20141068 | bottlenose dolphin | 7/20/2014 | VA | disentangled 07/20/2014 |
| VAQS20141077 | sei whale | 8/14/2014 | VA | died 08/21/2014 |
| VAQS20141083 | bottlenose dolphin | 9/20/2014 | VA | euthanized 09/20/2014 |
| VAQS20141089 | bottlenose dolphin | 10/20/2014 | VA | disentangled 10/20/2014 |
| VAQS20141093 | pygmy sperm whale | 11/18/2014 | VA | euthanized 11/18/2014 |
| VAQS20141094 | pygmy sperm whale | 12/1/2014 | VA | euthanized 12/01/2014 |

Table 3: Sea turtle strandings in Virginia during 2014, n=248.
(Data from the VAQS Sea Turtle Stranding Database)
[Length = cm, carapace length notch to tip; * indicates estimated length; ND = no data; U = unknown]

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20142002 | 1/5/2014 | loggerhead | Northampton | 37.3329 | -76.0124 | dead | U | 54.2 |
| VAQS20142001 | 1/7/2014 | loggerhead | Accomack | 37.5125 | -75.9538 | dead | U | 67.3 |
| VAQS20142003 | 1/15/2014 | Kemp's ridley | Virginia Beach | 36.9605 | -76.0720 | dead | F | 46.2 |
| VAQS20142004 | 1/30/2014 | loggerhead | Northampton | 37.2442 | -76.0185 | dead | U | 63.5 |
| VAQS20142005 | 2/22/2014 | green | Northampton | 37.1275 | -75.9698 | dead | U | 25.0 |
| VAQS20142006 | 2/22/2014 | green | Northampton | 37.1275 | -75.9698 | dead | U | 33.2 |
| VAQS20142007 | 4/21/2014 | green | Northampton | 37.0861 | -75.9740 | dead | U | 30.2 |
| VAQS20142008 | 4/27/2014 | Kemp's ridley | Virginia Beach | 36.9233 | -76.0498 | dead | U | 38.0 |
| VAQS20142009 | 5/11/2014 | loggerhead | Northampton | 37.1660 | -75.9874 | dead | F | 61.4 |
| VAQS20142011 | 5/19/2014 | Kemp's ridley | Norfolk | 36.9392 | -76.2217 | dead | F | 45.7 |
| VAQS20142010 | 5/19/2014 | loggerhead | Norfolk | 36.9387 | -76.2203 | dead | M | 74.9 |
| VAQS20142012 | 5/20/2014 | loggerhead | Virginia Beach | 36.9083 | -75.9889 | dead | M | 68.0 |
| VAQS20142064 | 5/20/2014 | Kemp's ridley | Northampton | 37.1376 | -75.8776 | dead | U | 41.0 |
| VAQS20142013 | 5/22/2014 | Kemp's ridley | Virginia Beach | 36.9195 | -76.1305 | dead | F | 50.2* |
| VAQS20142016 | 5/23/2014 | Kemp's ridley | Virginia Beach | 36.6943 | -75.9221 | alive | U | 49.8* |
| VAQS20142015 | 5/23/2014 | Kemp's ridley | Virginia Beach | 36.9147 | -76.1168 | dead | M | 45.7 |
| VAQS20142014 | 5/23/2014 | Kemp's ridley | Virginia Beach | 36.9166 | -76.0612 | dead | U | ND |
| VAQS20142017 | 5/24/2014 | Kemp's ridley | Northampton | 37.0950 | -75.9806 | dead | U | 35.5 |
| VAQS20142022 | 5/24/2014 | loggerhead | Virginia Beach | 36.8919 | -76.0702 | dead | F | 64.0* |
| VAQS20142018 | 5/25/2014 | loggerhead | Hampton | 37.0878 | -76.2708 | dead | U | 60.7 |
| VAQS20142019 | 5/25/2014 | loggerhead | Virginia Beach | 36.8448 | -75.9723 | dead | M | 78.7* |
| VAQS20142021 | 5/26/2014 | loggerhead | Northampton | 37.0977 | -75.9807 | dead | M | 65.2 |
| VAQS20142020 | 5/26/2014 | loggerhead | Virginia Beach | 36.7440 | -75.9423 | dead | F | 102.2* |
| VAQS20142023 | 5/27/2014 | loggerhead | Virginia Beach | 36.9188 | -76.1297 | dead | M | 72.2 |
| VAQS20142024 | 5/27/2014 | loggerhead | Virginia Beach | 36.9211 | -75.9955 | dead | F | 74.3 |
| VAQS20142025 | 5/28/2014 | loggerhead | Norfolk | 36.9130 | -76.3306 | dead | U | ND |
| VAQS20142029 | 5/28/2014 | loggerhead | Northampton | 37.3271 | -76.0157 | dead | M | ND |
| VAQS20142027 | 5/29/2014 | Kemp's ridley | Norfolk | 36.9316 | -76.1915 | dead | F | 53.3 |
| VAQS20142026 | 5/29/2014 | loggerhead | Northumberland | 37.7333 | -76.3076 | dead | U | 62.2 |
| VAQS20142028 | 5/29/2014 | unidentified | Mathews | 37.5154 | -76.2918 | dead | U | ND |
| VAQS20142033 | 5/30/2014 | Kemp's ridley | Hampton | 37.0503 | -76.2858 | dead | F | 50.1 |
| VAQS20142032 | 5/30/2014 | loggerhead | Northumberland | 37.7325 | -76.3073 | dead | F | 72.3 |
| VAQS20142034 | 5/30/2014 | loggerhead | Norfolk | 36.9568 | -76.2532 | dead | F | 79.0 |
| VAQS20142030 | 5/30/2014 | Kemp's ridley | Northampton | 37.1309 | -75.9705 | dead | U | ND |
| VAQS20142031 | 5/30/2014 | loggerhead | Northumberland | 37.7317 | -76.3070 | dead | U | 78.5 |
| VAQS20142055 | 5/31/2014 | loggerhead | Mathews | 37.4567 | -76.2605 | dead | U | ND |
| VAQS20142035 | 5/31/2014 | loggerhead | Virginia Beach | 36.9083 | -75.9892 | dead | U | ND |
| VAQS20142041 | 6/1/2014 | loggerhead | Virginia Beach | 36.6705 | -75.9110 | dead | F | 59.7 |
| VAQS20142042 | 6/1/2014 | loggerhead | Lancaster | 37.6381 | -76.3004 | dead | F | 72.1 |
| VAQS20142037 | 6/1/2014 | loggerhead | York | 37.2030 | -76.3992 | dead | F | 78.5 |
| VAQS20142036 | 6/1/2014 | loggerhead | Virginia Beach | 36.7197 | -75.9327 | dead | F | 62.0* |
| VAQS20142038 | 6/1/2014 | loggerhead | Norfolk | 36.9497 | -76.2420 | dead | M | 88.0* |
| VAQS20142039 | 6/1/2014 | loggerhead | Mathews | 37.3678 | -76.2567 | dead | U | 69.9 |
| VAQS20142040 | 6/1/2014 | loggerhead | Virginia Beach | 36.9133 | -76.0772 | dead | M | ND |
| VAQS20142047 | 6/1/2014 | loggerhead | Hampton | 37.0462 | -76.2868 | dead | M | 63.4* |
| VAQS20142050 | 6/1/2014 | loggerhead | Mathews | 37.3690 | -76.2573 | dead | U | 56.0 |
| VAQS20142058 | 6/1/2014 | loggerhead | Hampton | 37.0938 | -76.3049 | dead | U | 67.5* |
| VAQS20142054 | 6/1/2014 | loggerhead | Middlesex | 37.5339 | -76.3289 | dead | U | ND |
| VAQS20142056 | 6/1/2014 | loggerhead | Lancaster | 37.1747 | -76.3934 | dead | U | ND |
| VAQS20142043 | 6/2/2014 | loggerhead | Lancaster | 37.6580 | -76.3380 | dead | F | 58.4 |
| VAQS20142046 | 6/2/2014 | loggerhead | Northampton | 37.3535 | -75.9959 | dead | F | 64.8 |
| VAQS20142044 | 6/2/2014 | loggerhead | Virginia Beach | 36.7891 | -75.9587 | dead | F | 78.7 |
| VAQS20142048 | 6/2/2014 | loggerhead | Newport News | 36.9768 | -76.4344 | dead | F | 61.7* |
| VAQS20142049 | 6/2/2014 | loggerhead | Virginia Beach | 36.7861 | -75.9578 | dead | U | 86.3* |
| VAQS20142045 | 6/2/2014 | loggerhead | Northampton | 37.3291 | -76.0146 | dead | M | ND |
| VAQS20142057 | 6/3/2014 | Kemp's ridley | Virginia Beach | 36.8437 | -75.9705 | alive | U | 23.9 |
| VAQS20142052 | 6/3/2014 | Kemp's ridley | Northampton | 37.1659 | -75.9873 | dead | U | 24.1 |
| VAQS20142051 | 6/3/2014 | loggerhead | Northampton | 37.2441 | -76.0184 | dead | F | 53.7 |

Table 3: Sea turtle strandings *cont.*

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20142059 | 6/3/2014 | loggerhead | Virginia Beach | 36.8110 | -75.9650 | dead | U | 66.4 |
| VAQS20142053 | 6/3/2014 | unidentified | Norfolk | 36.9867 | -76.2997 | dead | U | ND |
| VAQS20142060 | 6/4/2014 | Kemp's ridley | Virginia Beach | 36.7600 | -75.9482 | alive | U | 27.4 |
| VAQS20142061 | 6/4/2014 | loggerhead | Northampton | 37.0844 | -75.9634 | dead | U | 58.4 |
| VAQS20142062 | 6/4/2014 | loggerhead | Virginia Beach | 36.9318 | -76.0300 | dead | F | 61.4 |
| VAQS20142063 | 6/5/2014 | unidentified | Norfolk | 36.9641 | -76.2575 | alive | U | ND |
| VAQS20142067 | 6/6/2014 | unidentified | Norfolk | 36.9639 | -76.2574 | alive | U | ND |
| VAQS20142075 | 6/6/2014 | Kemp's ridley | Hampton | 37.0455 | -76.2878 | dead | M | 22.4 |
| VAQS20142072 | 6/6/2014 | Kemp's ridley | Virginia Beach | 36.9194 | -76.0543 | dead | M | 25.2 |
| VAQS20142070 | 6/6/2014 | Kemp's ridley | Hampton | 37.0107 | -76.2999 | dead | M | 41.0 |
| VAQS20142069 | 6/6/2014 | Kemp's ridley | Virginia Beach | 36.9138 | -76.0736 | dead | M | 62.0 |
| VAQS20142065 | 6/6/2014 | loggerhead | Virginia Beach | 36.6022 | -75.8797 | dead | F | 104.0* |
| VAQS20142066 | 6/6/2014 | Kemp's ridley | Virginia Beach | 36.9277 | -76.1669 | dead | F | 67.4* |
| VAQS20142071 | 6/6/2014 | loggerhead | Mathews | 37.4106 | -76.2501 | dead | M | 74.3* |
| VAQS20142068 | 6/6/2014 | loggerhead | Northampton | 37.4116 | -75.9820 | dead | U | ND |
| VAQS20142074 | 6/6/2014 | loggerhead | Northampton | 37.4313 | -75.6754 | dead | U | ND |
| VAQS20142073 | 6/6/2014 | loggerhead | Northampton | 37.4475 | -75.6592 | dead | U | ND |
| VAQS20142080 | 6/7/2014 | Kemp's ridley | Virginia Beach | 36.8438 | -75.9706 | alive | U | 27.9 |
| VAQS20142081 | 6/7/2014 | loggerhead | Hampton | 37.0634 | -76.2811 | dead | F | 68.6 |
| VAQS20142078 | 6/7/2014 | loggerhead | Virginia Beach | 36.8216 | -75.9674 | dead | U | 85.0* |
| VAQS20142082 | 6/7/2014 | loggerhead | Virginia Beach | 36.6961 | -75.9237 | dead | F | 72.1* |
| VAQS20142079 | 6/7/2014 | loggerhead | Virginia Beach | 36.9727 | -76.1101 | dead | U | ND |
| VAQS20142077 | 6/7/2014 | loggerhead | Northampton | 37.4863 | -75.9617 | dead | U | ND |
| VAQS20142083 | 6/7/2014 | unidentified | Northampton | 37.4962 | -75.9589 | dead | U | ND |
| VAQS20142076 | 6/7/2014 | loggerhead | Northampton | 37.1023 | -75.9792 | dead | U | 85.3* |
| VAQS20142084 | 6/7/2014 | loggerhead | Northampton | 37.1207 | -75.9527 | dead | U | ND |
| VAQS20142086 | 6/8/2014 | Kemp's ridley | Norfolk | 36.9585 | -76.2557 | dead | M | 41.2 |
| VAQS20142085 | 6/8/2014 | loggerhead | Northampton | 37.2801 | -76.0123 | dead | F | 69.7 |
| VAQS20142087 | 6/8/2014 | loggerhead | Northumberland | 37.7173 | -76.3181 | dead | U | ND |
| VAQS20142088 | 6/9/2014 | green | Northampton | 37.0898 | -75.9375 | dead | F | 32.4 |
| VAQS20142090 | 6/10/2014 | Kemp's ridley | Virginia Beach | 36.8435 | -75.9716 | alive | U | 21.7 |
| VAQS20142089 | 6/10/2014 | loggerhead | Newport News | 37.0275 | -76.4645 | dead | U | 83.5* |
| VAQS20142110 | 6/10/2014 | loggerhead | Northampton | 37.2152 | -76.0128 | dead | U | ND |
| VAQS20142092 | 6/11/2014 | loggerhead | Norfolk | 36.9478 | -76.2389 | dead | M | 67.9 |
| VAQS20142091 | 6/11/2014 | leatherback | Virginia Beach | 36.9031 | -75.9878 | dead | M | 146.9 |
| VAQS20142097 | 6/11/2014 | loggerhead | Middlesex | 37.5784 | -76.3981 | dead | U | 73.8* |
| VAQS20142095 | 6/12/2014 | leatherback | Virginia Beach | 36.9224 | -76.0544 | dead | M | 144.3 |
| VAQS20142093 | 6/13/2014 | loggerhead | Norfolk | 36.9479 | -76.2389 | dead | U | ND |
| VAQS20142096 | 6/13/2014 | loggerhead | Middlesex | 37.5471 | -76.3213 | dead | U | ND |
| VAQS20142094 | 6/13/2014 | loggerhead | Norfolk | 36.9326 | -76.3288 | dead | U | ND |
| VAQS20142098 | 6/14/2014 | Kemp's ridley | Virginia Beach | 36.9204 | -76.0527 | dead | F | 49.6 |
| VAQS20142100 | 6/14/2014 | loggerhead | Virginia Beach | 36.9132 | -76.1069 | dead | F | 92.2 |
| VAQS20142101 | 6/14/2014 | loggerhead | Virginia Beach | 36.9189 | -76.1289 | dead | U | ND |
| VAQS20142109 | 6/14/2014 | loggerhead | Westmoreland | 38.0653 | -76.5351 | dead | U | ND |
| VAQS20142099 | 6/14/2014 | loggerhead | Norfolk | 36.9319 | -76.1946 | dead | F | 58.2 |
| VAQS20142104 | 6/15/2014 | Kemp's ridley | Virginia Beach | 36.9151 | -76.0711 | alive | U | 24.9 |
| VAQS20142103 | 6/15/2014 | loggerhead | Virginia Beach | 36.9050 | -75.9883 | dead | F | 68.1* |
| VAQS20142102 | 6/15/2014 | loggerhead | Virginia Beach | 36.9204 | -76.1340 | dead | U | 74.3* |
| VAQS20142107 | 6/15/2014 | loggerhead | Newport News | 36.9768 | -76.4344 | dead | U | 67.2* |
| VAQS20142116 | 6/15/2014 | loggerhead | Accomack | 37.8496 | -75.9961 | dead | U | 79.6* |
| VAQS20142106 | 6/16/2014 | unidentified | Norfolk | 36.9640 | -76.2575 | alive | U | ND |
| VAQS20142105 | 6/16/2014 | Kemp's ridley | Northampton | 37.1591 | -75.9784 | dead | U | 25.4 |
| VAQS20142111 | 6/17/2014 | loggerhead | Hampton | 37.0359 | -76.2896 | alive | U | 61.3 |
| VAQS20142108 | 6/17/2014 | loggerhead | Virginia Beach | 36.6848 | -75.9186 | dead | F | 68.2 |
| VAQS20142114 | 6/17/2014 | loggerhead | Accomack | 38.0006 | -75.2594 | dead | F | 94 |
| VAQS20142113 | 6/18/2014 | Kemp's ridley | Northampton | 37.0913 | -75.9800 | dead | F | 28.4 |
| VAQS20142112 | 6/18/2014 | loggerhead | Accomack | 37.8572 | -75.4602 | dead | U | 65.5* |
| VAQS20142115 | 6/18/2014 | loggerhead | Northumberland | 37.8317 | -76.2628 | dead | U | ND |
| VAQS20142118 | 6/20/2014 | loggerhead | Norfolk | 36.9669 | -76.2727 | dead | F | 66.5* |
| VAQS20142119 | 6/21/2014 | Kemp's ridley | Northampton | 37.0915 | -75.9802 | dead | U | ND |
| VAQS20142125 | 6/22/2014 | loggerhead | Mathews | 37.5078 | -76.2817 | dead | F | 71.3* |
| VAQS20142120 | 6/22/2014 | loggerhead | Northumberland | 37.8419 | -76.2493 | dead | U | 70.4* |

Table 3: Sea turtle strandings *cont.*

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20142121 | 6/22/2014 | loggerhead | Accomack | 37.7410 | -75.5589 | dead | U | 75.0 |
| VAQS20142122 | 6/23/2014 | loggerhead | Virginia Beach | 36.9132 | -75.9905 | dead | M | 72.0 |
| VAQS20142123 | 6/23/2014 | loggerhead | Accomack | 37.8122 | -75.5077 | dead | F | 104* |
| VAQS20142124 | 6/23/2014 | loggerhead | Lancaster | 37.6615 | -76.3360 | dead | U | ND |
| VAQS20142117 | 6/23/2014 | loggerhead | Northampton | 37.1212 | -75.9536 | dead | U | 96.5 |
| VAQS20132230 | 6/25/2014 | Kemp's ridley | Virginia Beach | 36.9257 | -76.0553 | dead | F | 29.2 |
| VAQS20142126 | 6/26/2014 | loggerhead | Northampton | 37.0941 | -75.9806 | dead | U | 59.5 |
| VAQS20142127 | 6/26/2014 | Kemp's ridley | Gloucester | 37.3774 | -76.4241 | dead | U | ND |
| VAQS20142128 | 6/28/2014 | Kemp's ridley | Hampton | 37.0360 | -76.2896 | alive | U | 25.9 |
| VAQS20142133 | 6/28/2014 | loggerhead | Lancaster | 37.6518 | -76.3376 | dead | U | ND |
| VAQS20142129 | 6/28/2014 | loggerhead | Accomack | 37.6656 | -75.5920 | dead | U | 66.5* |
| VAQS20142104 | 6/29/2014 | Kemp's ridley | Virginia Beach | 36.8341 | -75.9692 | dead | M | 25.4 |
| VAQS20142130 | 6/29/2014 | loggerhead | Virginia Beach | 36.7752 | -75.9548 | dead | F | 89.4* |
| VAQS20142131 | 6/29/2014 | loggerhead | Virginia Beach | 36.7109 | -75.9295 | dead | F | 71.6* |
| VAQS20142134 | 6/29/2014 | unidentified | Lancaster | 37.6522 | -76.3380 | dead | U | ND |
| VAQS20142132 | 6/29/2014 | loggerhead | Northampton | 37.2039 | -76.0125 | dead | U | ND |
| VAQS20142135 | 6/30/2014 | loggerhead | Mathews | 37.4070 | -76.2490 | dead | M | 84.1* |
| VAQS20142136 | 7/3/2014 | loggerhead | Northampton | 37.1560 | -75.9769 | dead | U | ND |
| VAQS20142137 | 7/4/2014 | Kemp's ridley | Hampton | 37.0029 | -76.3580 | dead | U | 28.4 |
| VAQS20142128 | 7/5/2014 | Kemp's ridley | Norfolk | 36.9633 | -76.3218 | alive | U | 26.6 |
| VAQS20142139 | 7/5/2014 | Kemp's ridley | Norfolk | 36.9633 | -76.3218 | alive | U | 29.0 |
| VAQS20142138 | 7/5/2014 | green | Virginia Beach | 36.8211 | -75.9851 | alive | U | 30.9 |
| VAQS20142141 | 7/6/2014 | Kemp's ridley | Gloucester | 37.2452 | -76.5026 | alive | U | 22.3 |
| VAQS20142140 | 7/6/2014 | Kemp's ridley | Virginia Beach | 36.9166 | -76.0783 | alive | U | 25.7 |
| VAQS20142142 | 7/7/2014 | Kemp's ridley | Northampton | 37.1967 | -76.0077 | dead | M | 26.4 |
| VAQS20142143 | 7/8/2014 | loggerhead | Virginia Beach | 36.8874 | -76.0109 | dead | U | 64.5* |
| VAQS20142144 | 7/10/2014 | Kemp's ridley | Newport News | 36.9768 | -76.4343 | dead | F | 45.2 |
| VAQS20142147 | 7/11/2014 | loggerhead | Accomack | 37.8133 | -75.9677 | alive | U | 60.2 |
| VAQS20142145 | 7/12/2014 | loggerhead | Hampton | 37.1149 | -76.2452 | alive | U | ND |
| VAQS20142146 | 7/14/2014 | loggerhead | Virginia Beach | 36.6329 | -75.8921 | dead | U | ND |
| VAQS20142149 | 7/18/2014 | loggerhead | Virginia Beach | 36.7515 | -75.9449 | dead | F | 88.2* |
| VAQS20142148 | 7/18/2014 | loggerhead | Virginia Beach | 36.9866 | -76.1713 | dead | U | ND |
| VAQS20142150 | 7/20/2014 | loggerhead | Virginia Beach | 36.7774 | -75.9551 | dead | F | 64.5* |
| VAQS20142151 | 7/21/2014 | unidentified | Virginia Beach | 36.9669 | -76.1137 | alive | U | ND |
| VAQS20142152 | 7/23/2014 | Kemp's ridley | Hampton | 37.0360 | -76.2896 | alive | U | 35.1 |
| VAQS20142153 | 7/25/2014 | loggerhead | Virginia Beach | 36.8698 | -75.9793 | dead | U | 73.2* |
| VAQS20142154 | 7/28/2014 | Kemp's ridley | Northampton | 37.2022 | -76.0117 | dead | U | 26.0 |
| VAQS20142198 | 7/28/2014 | loggerhead | Accomack | 37.6637 | -75.8292 | dead | U | ND |
| VAQS20142156 | 7/29/2014 | green | Northampton | 37.1903 | -76.0008 | dead | U | ND |
| VAQS20142155 | 7/30/2014 | Kemp's ridley | Virginia Beach | 36.6943 | -75.9218 | alive | U | 26.7 |
| VAQS20142157 | 7/30/2014 | Kemp's ridley | Virginia Beach | 36.9124 | -76.1076 | dead | F | 51.0 |
| VAQS20142159 | 7/31/2014 | Kemp's ridley | Gloucester | 37.2489 | -76.4981 | dead | U | ND |
| VAQS20142158 | 8/2/2014 | loggerhead | Accomack | 37.9449 | -75.3064 | dead | U | 87.9* |
| VAQS20142160 | 8/3/2014 | loggerhead | Virginia Beach | 36.6286 | -75.8900 | dead | F | 68.8 |
| VAQS20142162 | 8/4/2014 | loggerhead | Northampton | 37.0853 | -75.9716 | dead | U | 64.7* |
| VAQS20142161 | 8/5/2014 | Kemp's ridley | Norfolk | 36.9588 | -76.2572 | dead | M | 56.3* |
| VAQS20142163 | 8/6/2014 | Kemp's ridley | Norfolk | 36.9588 | -76.2572 | dead | F | 60.6* |
| VAQS20142164 | 8/7/2014 | Kemp's ridley | Norfolk | 36.9331 | -76.2003 | dead | M | 32.0* |
| VAQS20142165 | 8/8/2014 | loggerhead | Virginia Beach | 36.5936 | -75.8771 | dead | F | 92.5 |
| VAQS20142166 | 8/9/2014 | Kemp's ridley | Virginia Beach | 36.8437 | -75.9701 | alive | U | 25.7 |
| VAQS20142167 | 8/10/2014 | loggerhead | Hampton | 37.0006 | -76.3171 | dead | U | ND |
| VAQS20142168 | 8/11/2014 | green | Virginia Beach | 36.7647 | -75.9507 | dead | U | 30.1* |
| VAQS20142172 | 8/11/2014 | loggerhead | Northampton | 37.1643 | -75.8489 | dead | U | ND |
| VAQS20142169 | 8/12/2014 | loggerhead | Norfolk | 36.9610 | -76.2611 | dead | M | 107.2* |
| VAQS20142170 | 8/13/2014 | loggerhead | Hampton | 37.0005 | -76.3616 | dead | U | ND |
| VAQS20142171 | 8/14/2014 | loggerhead | Virginia Beach | 36.9160 | -76.0631 | dead | F | ND |
| VAQS20142174 | 8/17/2014 | loggerhead | Northampton | 37.0832 | -75.9623 | dead | U | ND |
| VAQS20142173 | 8/19/2014 | loggerhead | Gloucester | 37.2464 | -76.5025 | dead | U | 58.0* |
| VAQS20142175 | 8/21/2014 | loggerhead | Norfolk | 36.9535 | -76.2482 | dead | M | 100.5 |
| VAQS20142176 | 8/23/2014 | loggerhead | Virginia Beach | 36.9270 | -76.0044 | dead | F | 83.1* |
| VAQS20142178 | 8/25/2014 | loggerhead | Virginia Beach | 36.5856 | -75.8753 | dead | F | 95.3 |
| VAQS20142177 | 8/26/2014 | loggerhead | Hampton | 37.0003 | -76.3672 | alive | U | 64.0* |

Table 3: Sea turtle strandings *cont.*

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20142179 | 8/27/2014 | loggerhead | Virginia Beach | 36.6839 | -75.9179 | dead | U | 105.0* |
| VAQS20142180 | 8/28/2014 | loggerhead | Virginia Beach | 36.9143 | -76.0702 | dead | U | 73.5 |
| VAQS20142181 | 8/29/2014 | Kemp's ridley | Hampton | 37.0164 | -76.2976 | dead | F | 31.2 |
| VAQS20142182 | 9/4/2014 | unidentified | Norfolk | 36.9625 | -76.2588 | alive | U | ND |
| VAQS20142184 | 9/4/2014 | unidentified | Norfolk | 36.9625 | -76.2590 | alive | U | ND |
| VAQS20142183 | 9/4/2014 | Kemp's ridley | Accomack | 37.9154 | -75.3252 | dead | U | 18.0 |
| VAQS20142186 | 9/5/2014 | loggerhead | Virginia Beach | 36.8798 | -75.8237 | dead | F | 89.6 |
| VAQS20142185 | 9/5/2014 | loggerhead | Accomack | 37.7848 | -75.5300 | dead | U | ND |
| VAQS20142188 | 9/11/2014 | loggerhead | Northumberland | 37.9302 | -76.3080 | dead | U | ND |
| VAQS20142187 | 9/12/2014 | Kemp's ridley | Norfolk | 36.9689 | -76.2830 | dead | U | 49.5* |
| VAQS20142190 | 9/12/2014 | loggerhead | Middlesex | 37.6113 | -76.5258 | dead | U | 63.2* |
| VAQS20142189 | 9/14/2014 | Kemp's ridley | Norfolk | 36.9417 | -76.2283 | dead | F | 20.5* |
| VAQS20142192 | 9/15/2014 | loggerhead | Norfolk | 36.9126 | -76.1860 | alive | U | ND |
| VAQS20142191 | 9/17/2014 | loggerhead | Virginia Beach | 36.9173 | -76.1253 | dead | F | 75.9 |
| VAQS20142193 | 9/17/2014 | loggerhead | Norfolk | 36.9437 | -76.2321 | dead | U | 68.8* |
| VAQS20142194 | 9/19/2014 | loggerhead | Virginia Beach | 36.6245 | -75.8883 | dead | M | 71.9* |
| VAQS20142195 | 9/19/2014 | loggerhead | Newport News | 36.9836 | -76.4388 | dead | U | 58.8* |
| VAQS20142196 | 9/25/2014 | green | Hampton | 37.0231 | -76.2963 | dead | M | 35.9 |
| VAQS20142197 | 9/26/2014 | loggerhead | Norfolk | 36.9648 | -76.2681 | dead | M | 66.3 |
| VAQS20142199 | 10/1/2014 | loggerhead | Hampton | 37.0566 | -76.2829 | dead | U | 67.2* |
| VAQS20142201 | 10/1/2014 | loggerhead | Norfolk | 36.9595 | -76.2581 | dead | M | 109.0* |
| VAQS20142200 | 10/2/2014 | loggerhead | Virginia Beach | 36.9213 | -75.9957 | dead | U | ND |
| VAQS20142204 | 10/2/2014 | Kemp's ridley | Virginia Beach | 36.9137 | -76.0746 | dead | U | ND |
| VAQS20142203 | 10/2/2014 | loggerhead | Accomack | 37.6399 | -75.6003 | dead | U | ND |
| VAQS20142205 | 10/3/2014 | Kemp's ridley | Virginia Beach | 36.8339 | -75.9687 | dead | F | 67.8 |
| VAQS20142202 | 10/8/2014 | Kemp's ridley | Northampton | 37.1791 | -75.9918 | dead | U | 28.7 |
| VAQS20142206 | 10/9/2014 | loggerhead | Northampton | 37.2200 | -76.0124 | dead | U | 57.2 |
| VAQS20142207 | 10/9/2014 | Kemp's ridley | Norfolk | 36.9447 | -76.2342 | dead | M | 53.7* |
| VAQS20142208 | 10/10/2014 | Kemp's ridley | Northampton | 37.0936 | -75.9803 | dead | U | 29.7 |
| VAQS20142209 | 10/10/2014 | Kemp's ridley | Newport News | 37.0253 | -76.4618 | dead | F | 41.4 |
| VAQS20142212 | 10/12/2014 | Kemp's ridley | Northampton | 37.1834 | -75.9946 | dead | M | 23.5 |
| VAQS20142211 | 10/13/2014 | Kemp's ridley | Norfolk | 36.9641 | -76.2574 | alive | U | ND |
| VAQS20142210 | 10/13/2014 | loggerhead | Virginia Beach | 36.5741 | -75.8727 | dead | M | 102.0* |
| VAQS20142214 | 10/17/2014 | Kemp's ridley | Northampton | 37.1037 | -75.9790 | dead | U | 44.3 |
| VAQS20142213 | 10/17/2014 | Kemp's ridley | Northampton | 37.1048 | -75.9784 | dead | U | 43.8* |
| VAQS20142215 | 10/17/2014 | Kemp's ridley | Northampton | 37.1037 | -75.9790 | dead | U | ND |
| VAQS20142216 | 10/21/2014 | green | Northampton | 37.1590 | -75.9782 | dead | U | 29.2 |
| VAQS20142217 | 10/21/2014 | loggerhead | Norfolk | 36.9238 | -76.1442 | dead | U | ND |
| VAQS20142218 | 10/23/2014 | loggerhead | Virginia Beach | 36.9177 | -76.1267 | dead | F | 93.9 |
| VAQS20142219 | 10/25/2014 | Kemp's ridley | Virginia Beach | 36.9149 | -76.1172 | dead | U | ND |
| VAQS20142220 | 10/29/2014 | loggerhead | Northampton | 37.2768 | -76.0165 | dead | F | 83.0 |
| VAQS20142221 | 10/30/2014 | Kemp's ridley | Northampton | 37.1659 | -75.9871 | dead | U | 51.8 |
| VAQS20142222 | 10/31/2014 | Kemp's ridley | Virginia Beach | 36.9205 | -76.1335 | dead | F | 43.9 |
| VAQS20142224 | 11/1/2014 | Kemp's ridley | Virginia Beach | 36.6665 | -75.9088 | dead | F | 31.4 |
| VAQS20142223 | 11/1/2014 | Kemp's ridley | Virginia Beach | 36.7801 | -75.9562 | dead | M | 43.1 |
| VAQS20142225 | 11/2/2014 | Kemp's ridley | Virginia Beach | 36.9149 | -76.0657 | dead | M | 40.2 |
| VAQS20142226 | 11/3/2014 | loggerhead | Northampton | 37.3437 | -76.0037 | dead | M | 62.8 |
| VAQS20142228 | 11/5/2014 | Kemp's ridley | Virginia Beach | 36.6829 | -75.9180 | dead | U | 28.9 |
| VAQS20142227 | 11/5/2014 | loggerhead | Norfolk | 36.9442 | -76.2333 | dead | M | 61.0* |
| VAQS20142229 | 11/6/2014 | Kemp's ridley | Norfolk | 36.9299 | -76.1828 | dead | F | 46.5* |
| VAQS20142230 | 11/8/2014 | Kemp's ridley | Norfolk | 36.9333 | -76.2017 | dead | M | 26.1 |
| VAQS20142231 | 11/10/2014 | Kemp's ridley | Virginia Beach | 36.9081 | -76.0898 | dead | M | 39.8* |
| VAQS20142232 | 11/12/2014 | Kemp's ridley | Northampton | 37.1210 | -75.9696 | dead | M | 52.0* |
| VAQS20142233 | 11/13/2014 | Kemp's ridley | Norfolk | 36.9362 | -76.2129 | dead | F | 32.1* |
| VAQS20142234 | 11/14/2014 | Kemp's ridley | Virginia Beach | 36.9196 | -76.1319 | dead | U | ND |
| VAQS20142235 | 11/15/2014 | loggerhead | Virginia Beach | 36.9133 | -76.0782 | alive | U | 69.7 |
| VAQS20142236 | 11/17/2014 | loggerhead | Virginia Beach | 36.9111 | -75.9901 | alive | U | 70.3 |
| VAQS20142237 | 11/19/2014 | loggerhead | Hampton | 37.0795 | -76.2776 | dead | M | 93.1 |
| VAQS20142238 | 11/21/2014 | loggerhead | Accomack | 37.9452 | -75.7401 | dead | U | 65.5 |
| VAQS20142239 | 11/22/2014 | green | Accomack | 37.8877 | -75.3447 | dead | U | 30.2 |
| VAQS20142240 | 11/23/2014 | loggerhead | Accomack | 37.9493 | -75.4211 | dead | F | 71.6 |
| VAQS20142241 | 11/28/2014 | loggerhead | Northampton | 37.4064 | -75.9735 | dead | F | 97.4 |

Table 3: Sea turtle strandings *cont.*

| Field Number | Date | Species | Location | Latitude | Longitude | Condition | Sex | Length |
|---|---|---|---|---|---|---|---|---|
| VAQS20142242 | 12/8/2014 | green | Norfolk | 36.9378 | -76.2181 | alive | U | 31.8 |
| VAQS20142243 | 12/13/2014 | Kemp's ridley | Northampton | 37.0912 | -75.9787 | dead | U | 39.7 |
| VAQS20142244 | 12/21/2014 | Kemp's ridley | Northampton | 37.2834 | -76.1002 | alive | U | 44.0 |
| VAQS20142245 | 12/21/2014 | green | Virginia Beach | 36.9197 | -75.9943 | dead | U | 27.1 |

Table 4: Live stranded sea turtles recorded by VAQS in 2014, n=41.

| Field Number | Strand Date | Species | State | Final Disposition |
|---|---|---|---|---|
| VAQS20142016 | 05/23/14 | Kemp's ridley | VA | released 22 June 2014 from Virginia Beach, VA |
| VAQS20142057 | 06/03/14 | Kemp's ridley | VA | released 17 July 2014 from offshore Virginia Beach, VA |
| VAQS20142060 | 06/04/14 | Kemp's ridley | VA | released 23 September 2014 from Virginia Beach, VA |
| VAQS20142063 | 06/05/14 | unidentified | VA | hooked and released 5 June 2014 at Oceanview pier |
| VAQS20142067 | 06/06/14 | unidentified | VA | hooked and released 6 June 2014 at Oceanview pier |
| VAQS20142080 | 06/07/14 | Kemp's ridley | VA | released 18 August 2014 from Virginia Beach, VA |
| VAQS20142090 | 06/10/14 | Kemp's ridley | VA | released 22 June 2014 from Virginia Beach, VA |
| VAQS20142104 | 06/15/14 | Kemp's ridley | VA | released 22 June 2014 from Virginia Beach, VA |
| VAQS20142106 | 06/16/14 | unidentified | VA | hooked and released 16 June 2014 at Oceanview pier |
| VAQS20142111 | 06/17/14 | loggerhead | VA | released 7 July 2014 from offshore Virginia Beach, VA |
| VAQS20142128 | 06/28/14 | Kemp's ridley | VA | released 7 July 2014 from offshore Virginia Beach, VA |
| VAQS20142139 | 07/05/14 | Kemp's ridley | VA | released 7 July 2014 from offshore Virginia Beach, VA |
| VAQS20142138 | 07/05/14 | green | VA | released 18 August 2014 from Virginia Beach, VA |
| VAQS20142128 | 07/05/14 | Kemp's ridley | VA | released 18 August 2014 from Virginia Beach, VA |
| VAQS20142140 | 07/06/14 | Kemp's ridley | VA | released 2 September 2014 from offshore Virginia Beach, VA |
| VAQS20142141 | 07/06/14 | Kemp's ridley | VA | released 5 September 2014 from Virginia Beach, VA |
| VAQS20142147 | 07/11/14 | loggerhead | VA | released 20 October 2014 from Virginia Beach, VA |
| VAQS20142145 | 07/12/14 | loggerhead | VA | hooked and released 12 July 2014 at Oceanview Fishing Pier |
| VAQS20142151 | 07/21/14 | unidentified | VA | hooked and released 21 July 2014 at Chesapeake Bay Bridge Tunnel pier |
| VAQS20142152 | 07/23/14 | Kemp's ridley | VA | released 2 September 2014 from offshore Virginia Beach, VA |
| VAQS20142155 | 07/30/14 | Kemp's ridley | VA | released 20 October 2014 from Virginia Beach, VA |
| VAQS20142166 | 08/09/14 | Kemp's ridley | VA | released 5 September 2014 from Virginia Beach, VA |
| VAQS20142177 | 08/26/14 | loggerhead | VA | pending |
| VAQS20142182 | 09/04/14 | unidentified | VA | hooked and released 4 September 2014 at Oceanview pier |
| VAQS20142184 | 09/04/14 | unidentified | VA | hooked and released 4 September 2014 at Oceanview pier |
| VAQS20142192 | 09/15/14 | loggerhead | VA | hooked and broke line 15 September 2014 at Little Creek Amphibious Base pier |
| VAQS20142211 | 10/13/14 | Kemp's ridley | VA | hooked and released 13 October 2014 in Oceanview, VA |
| VAQS20142235 | 11/15/14 | loggerhead | VA | pending |
| VAQS20142236 | 11/17/14 | loggerhead | VA | pending |
| NEST-14-409-Lk* | 11/20/14 | Kemp's ridley | MA | pending |
| NEST-14-427-Lk* | 11/20/14 | Kemp's ridley | MA | pending |
| NEST-14-397-Lk* | 11/21/14 | Kemp's ridley | MA | pending |
| NEST-14-404-Lk* | 11/21/14 | Kemp's ridley | MA | pending |
| NEST-14-407-Lk* | 11/21/14 | Kemp's ridley | MA | pending |
| NEST-14-408-Lk* | 11/21/14 | Kemp's ridley | MA | pending |
| NEST-14-428-Lk* | 11/21/14 | Kemp's ridley | MA | pending |
| NEST-14-413-Lk* | 11/22/14 | Kemp's ridley | MA | pending |
| NEST-14-399-Lk* | 11/22/14 | Kemp's ridley | MA | pending |
| NEST-14-400-Lk* | 11/22/14 | Kemp's ridley | MA | pending |
| VAQS20142242 | 12/08/14 | green | VA | pending |
| VAQS20142244 | 12/21/14 | Kemp's ridley | VA | pending |

*Transferred from New England Aquarium, Quincy, MA for rehabilitation

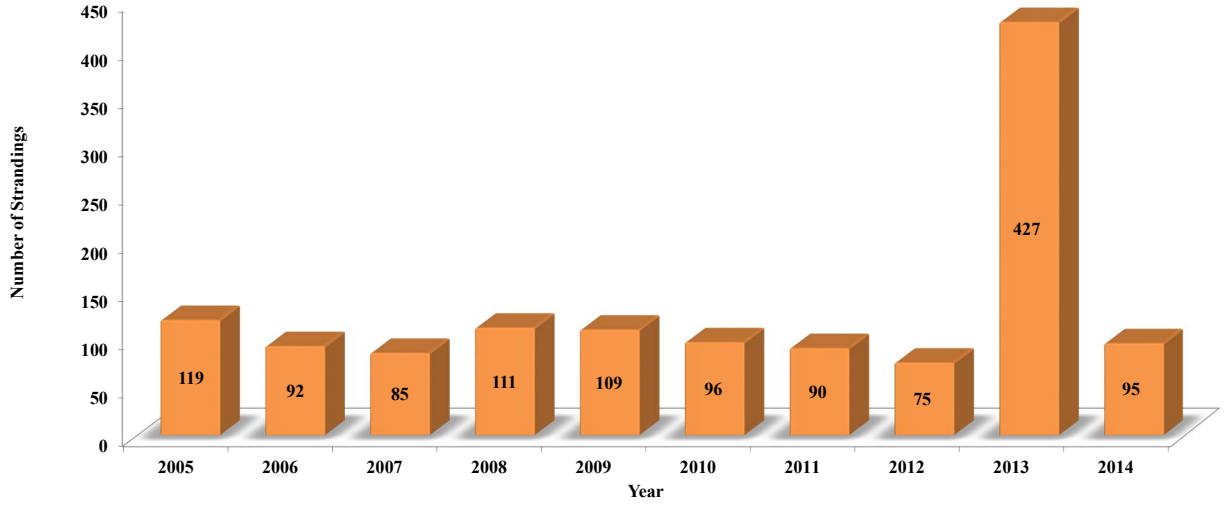



Figure 1: Yearly frequency of marine mammal strandings in Virginia, 2005-2014.

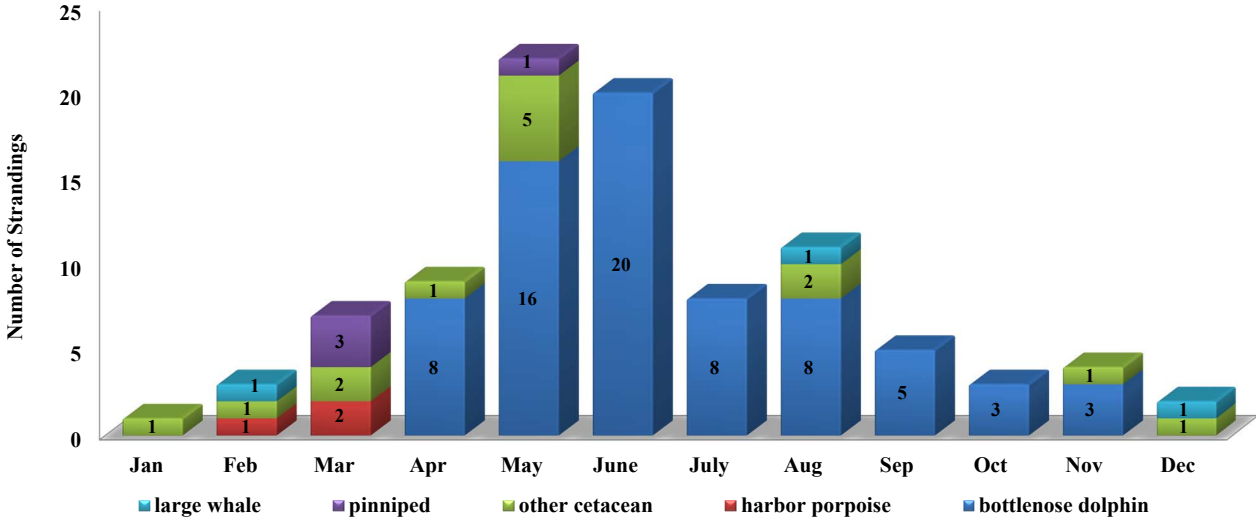



Figure 2: Monthly frequency of marine mammal strandings in Virginia from 2014.

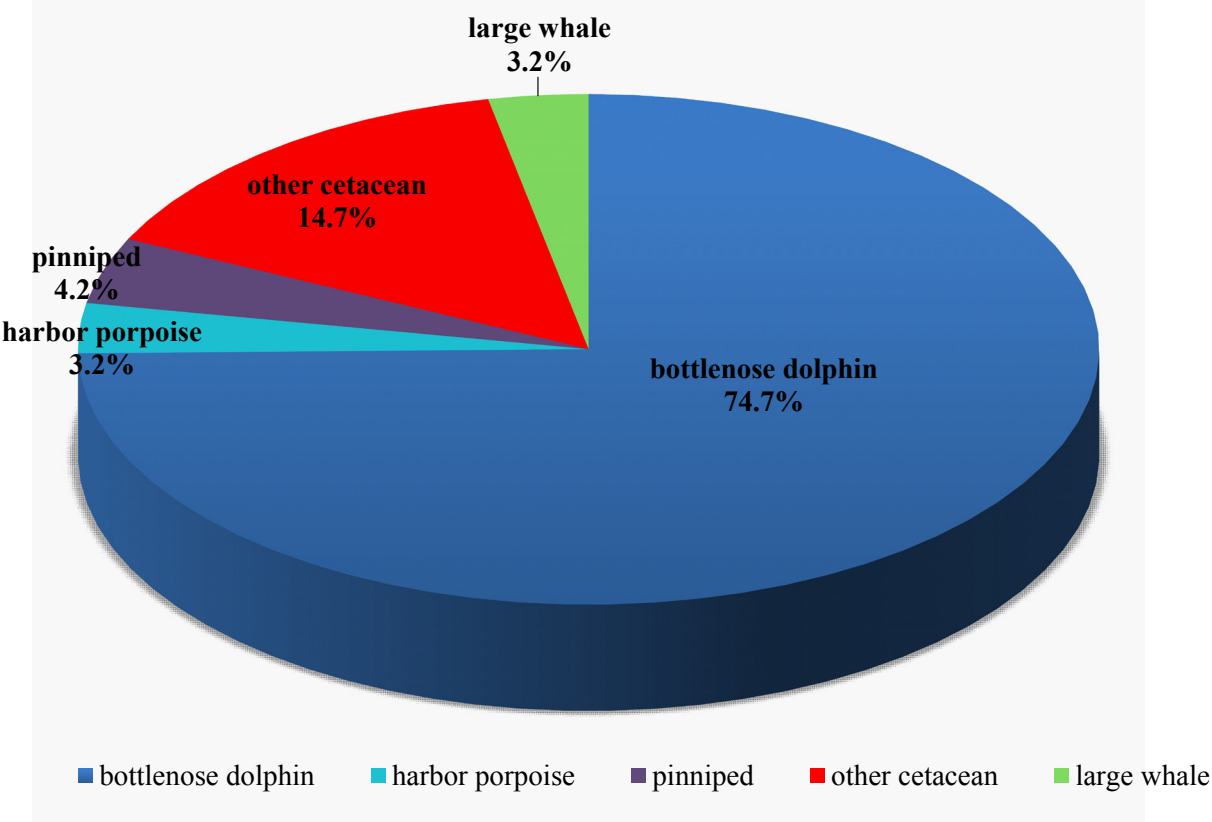



Figure 3: Marine mammal strandings in Virginia from 2014.

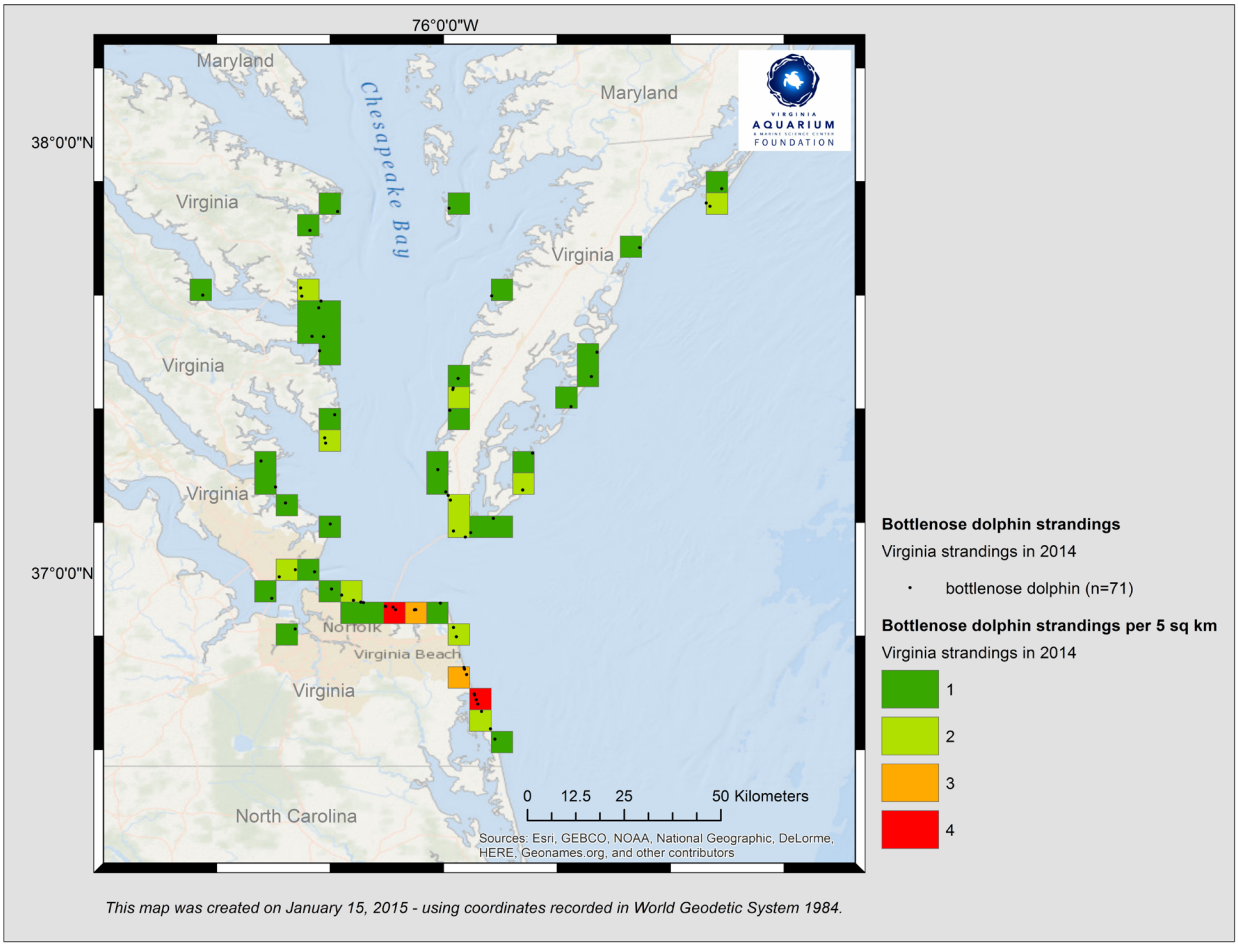



Figure 4: Point count of Virginia bottlenose dolphin strandings from 2014.

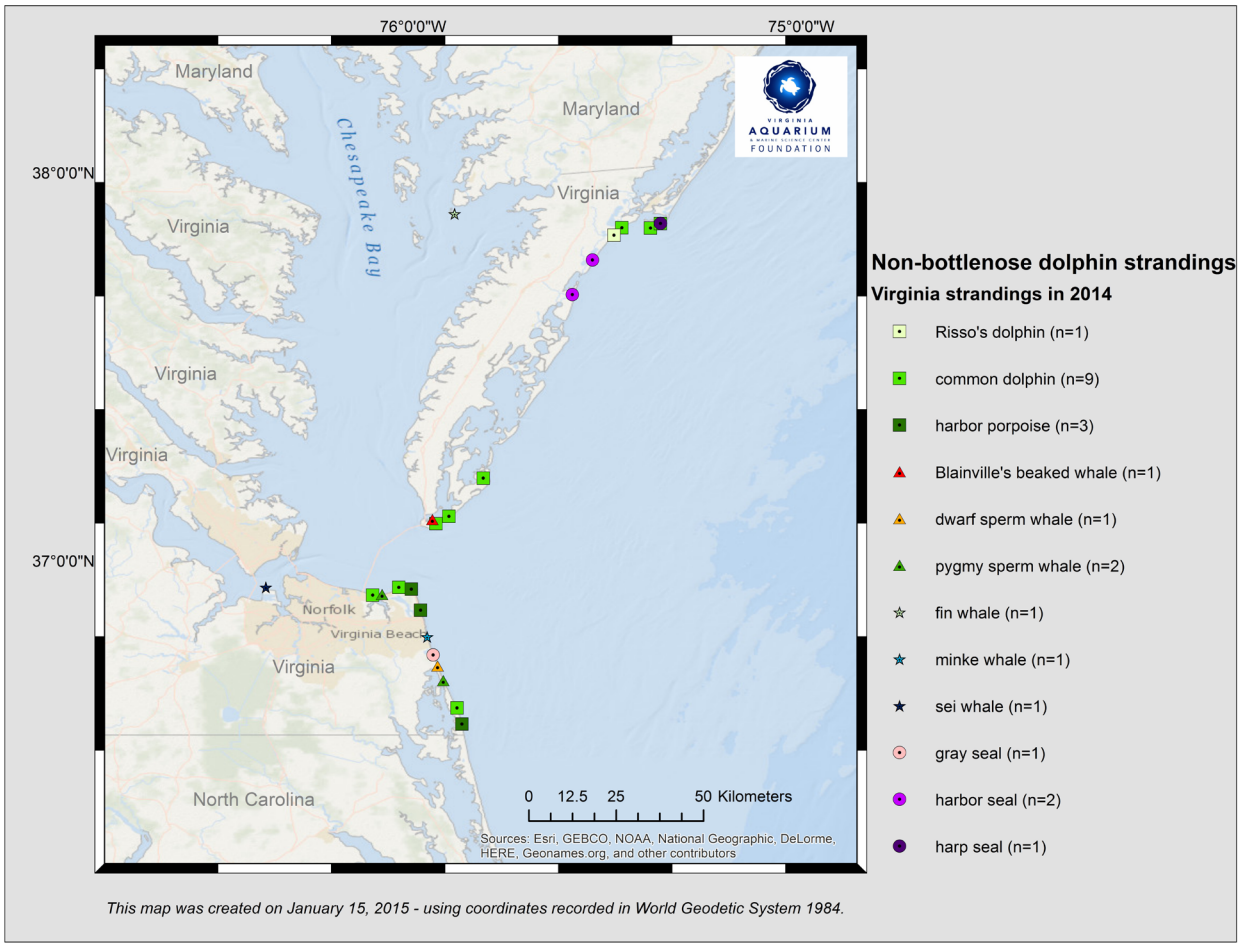
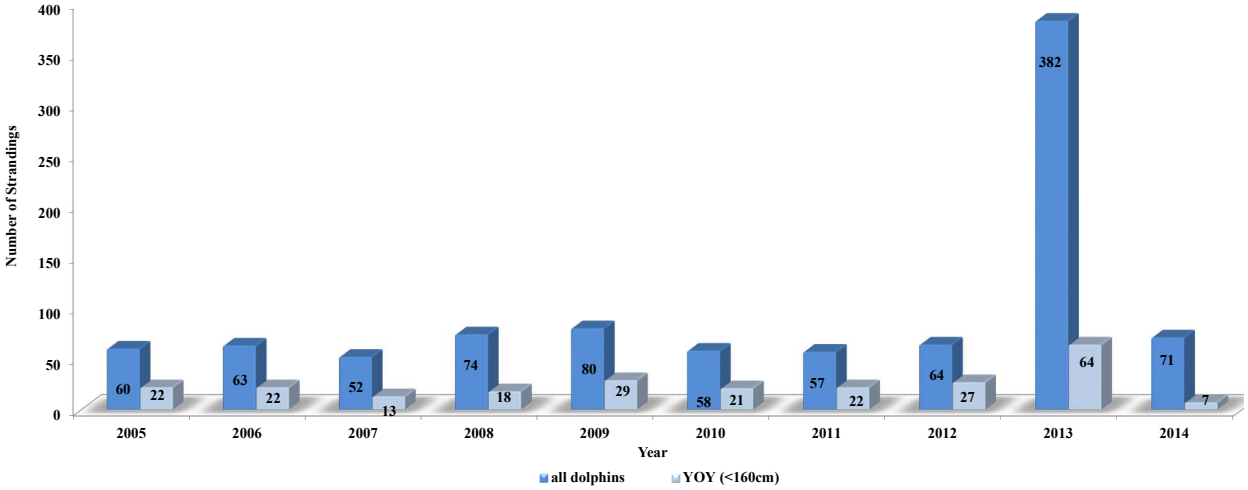



Figure 5: Location of Virginia non-bottlenose dolphin marine mammal strandings from 2014.

A. Bottlenose dolphin




B. Harbor porpoise

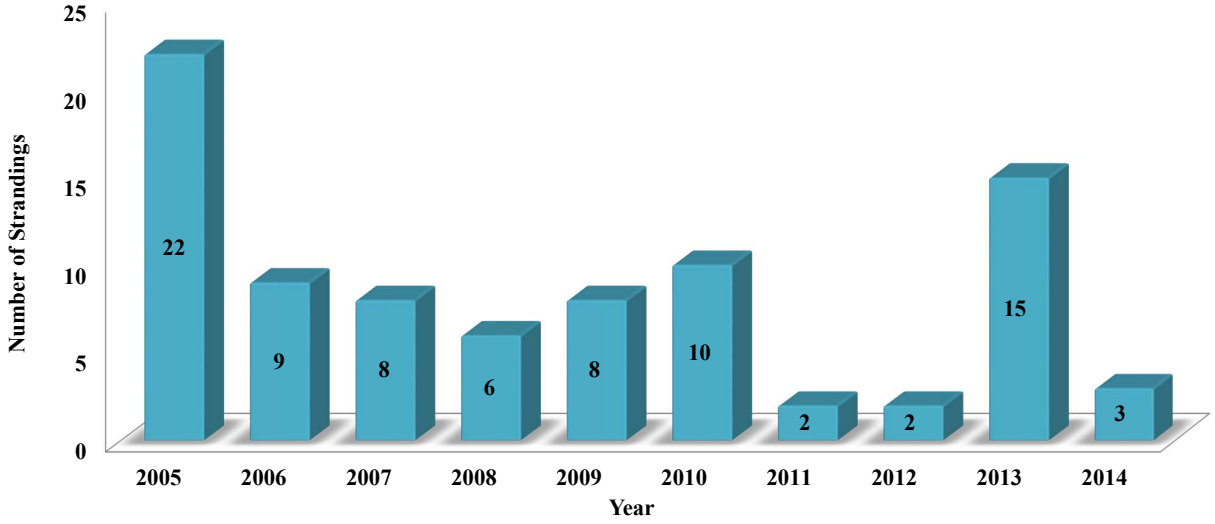
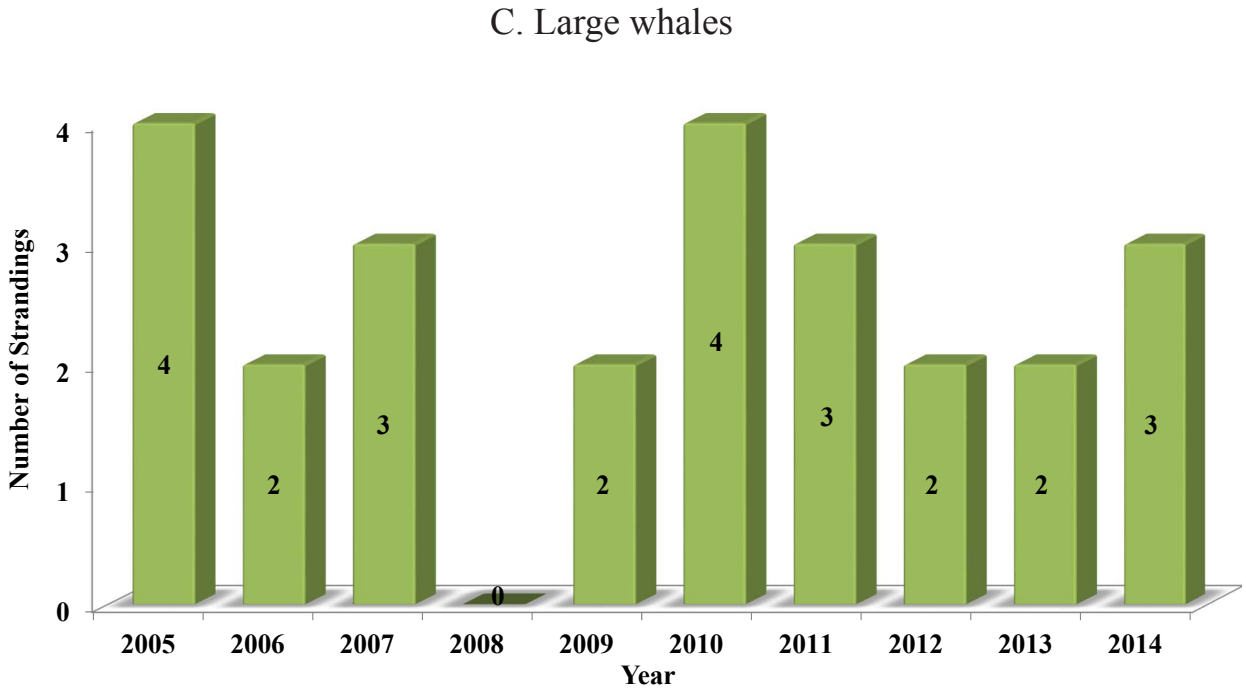



Figure 6 A-B: Yearly stranding frequency for bottlenose dolphin and harbor porpoise in Virginia, 2005-2014 (YOY = young of the year).



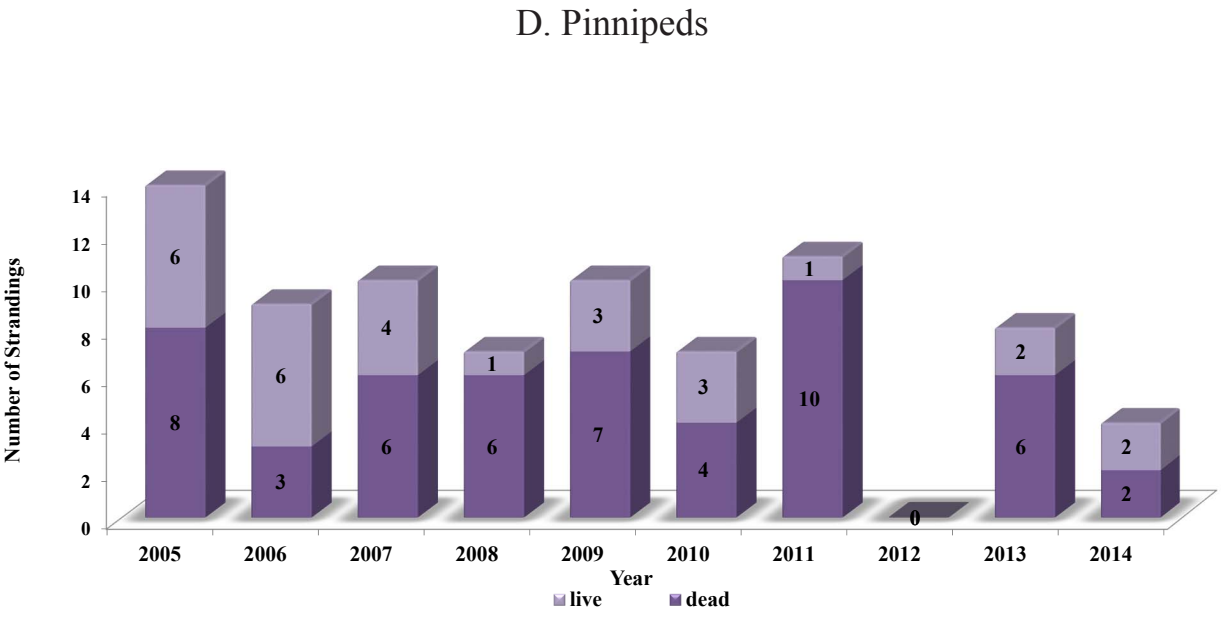




Figure 6 C-D: Yearly stranding frequency for large whales and pinnipeds in Virginia, 2005-2014.

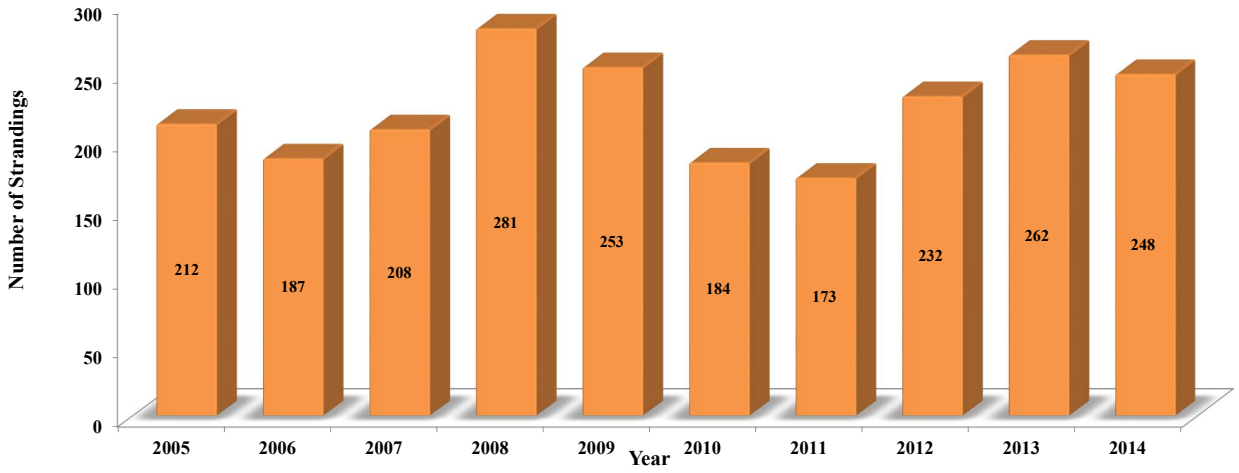



Figure 7: Yearly frequency of sea turtle strandings in Virginia, 2005-2014.

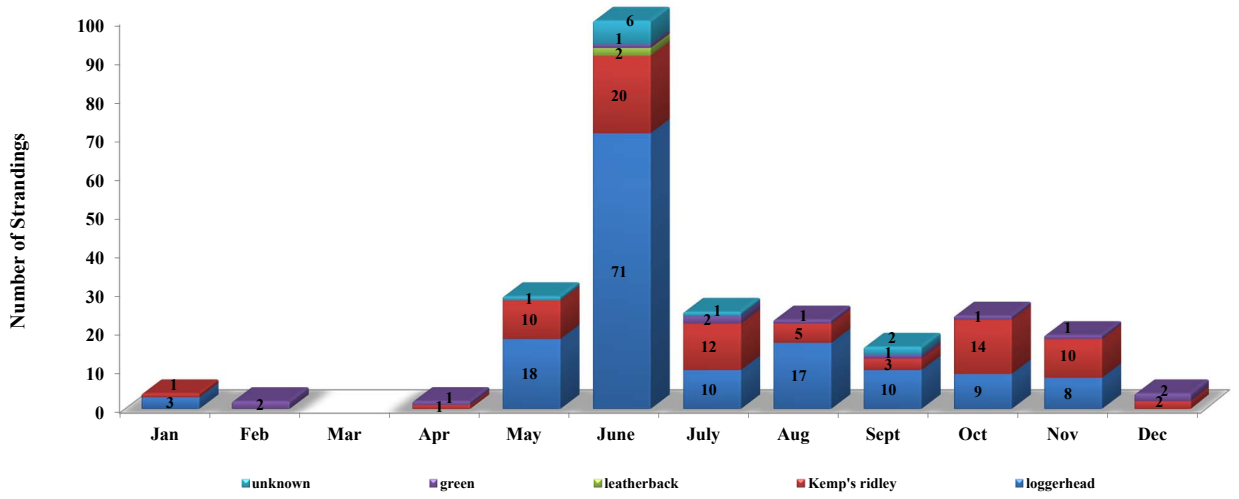



Figure 8: Monthly frequency of sea turtle strandings in Virginia from 2014.

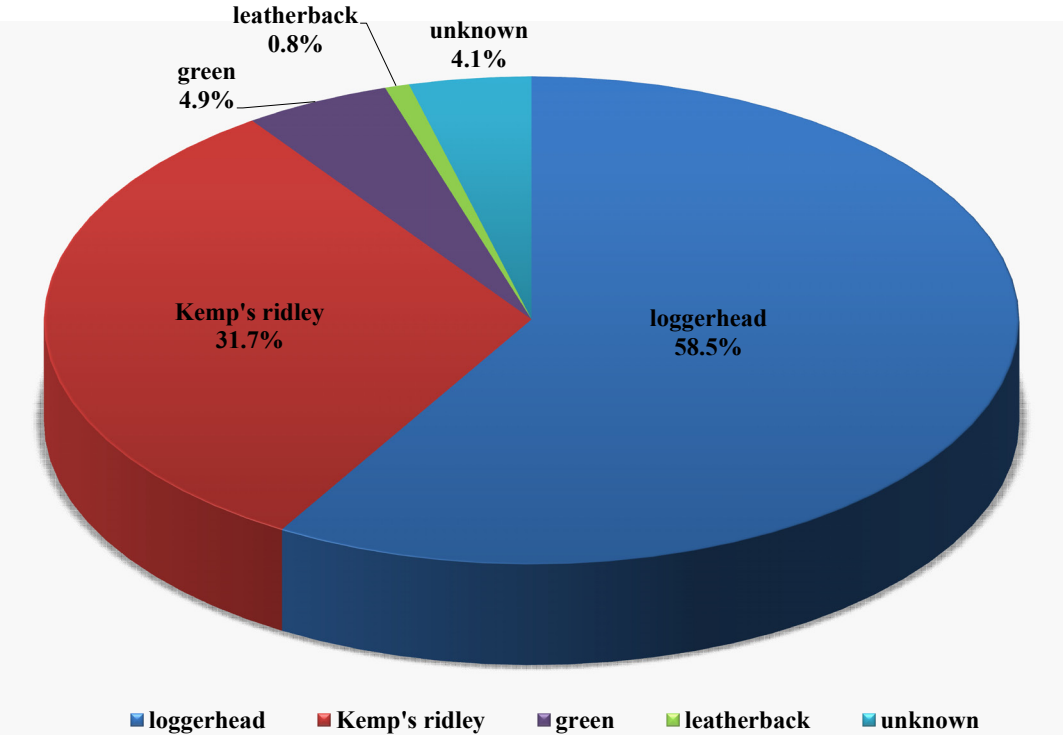



Figure 9: Sea turtle strandings in Virginia from 2014.

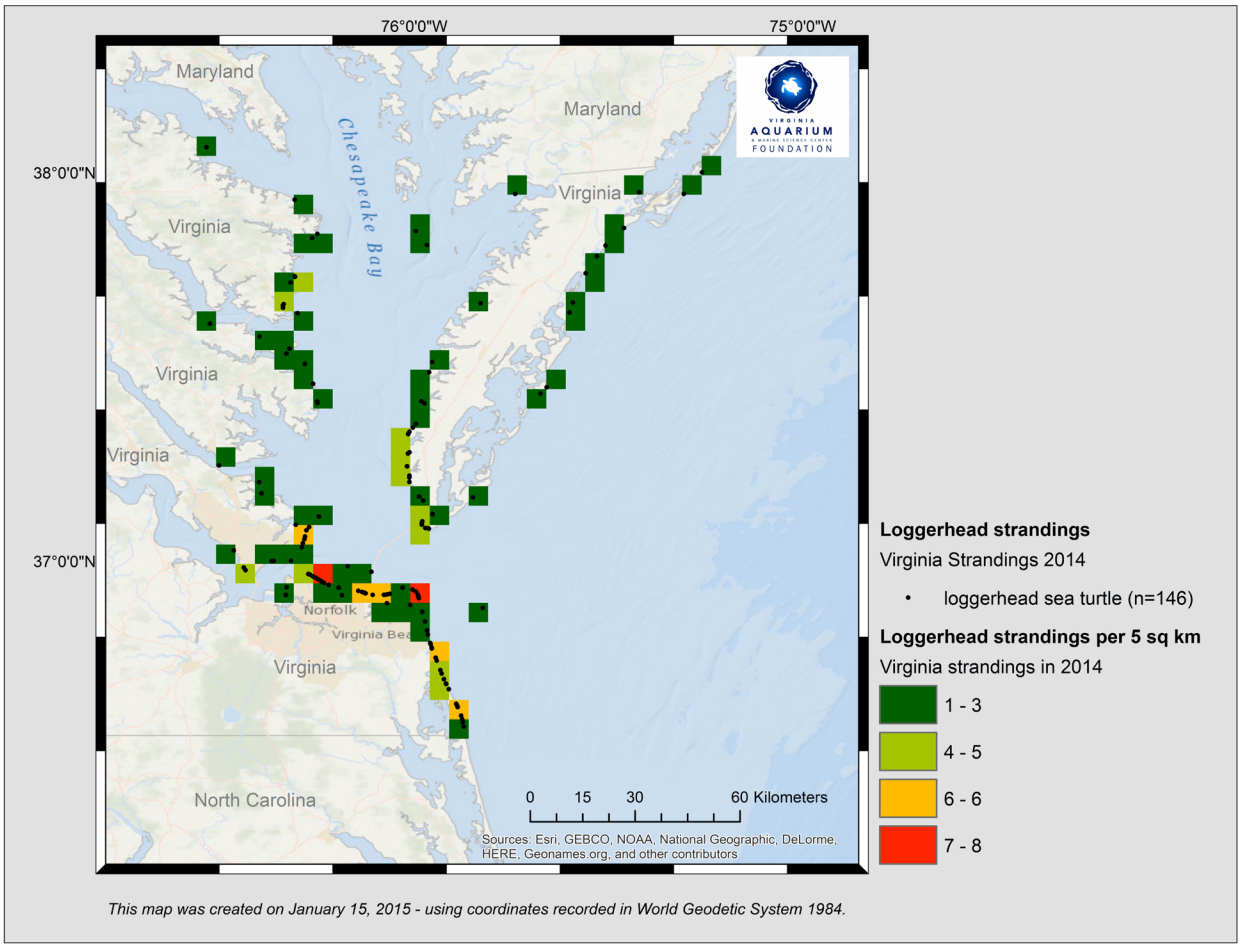



Figure 10: Location of Virginia loggerhead sea turtle strandings from 2014.

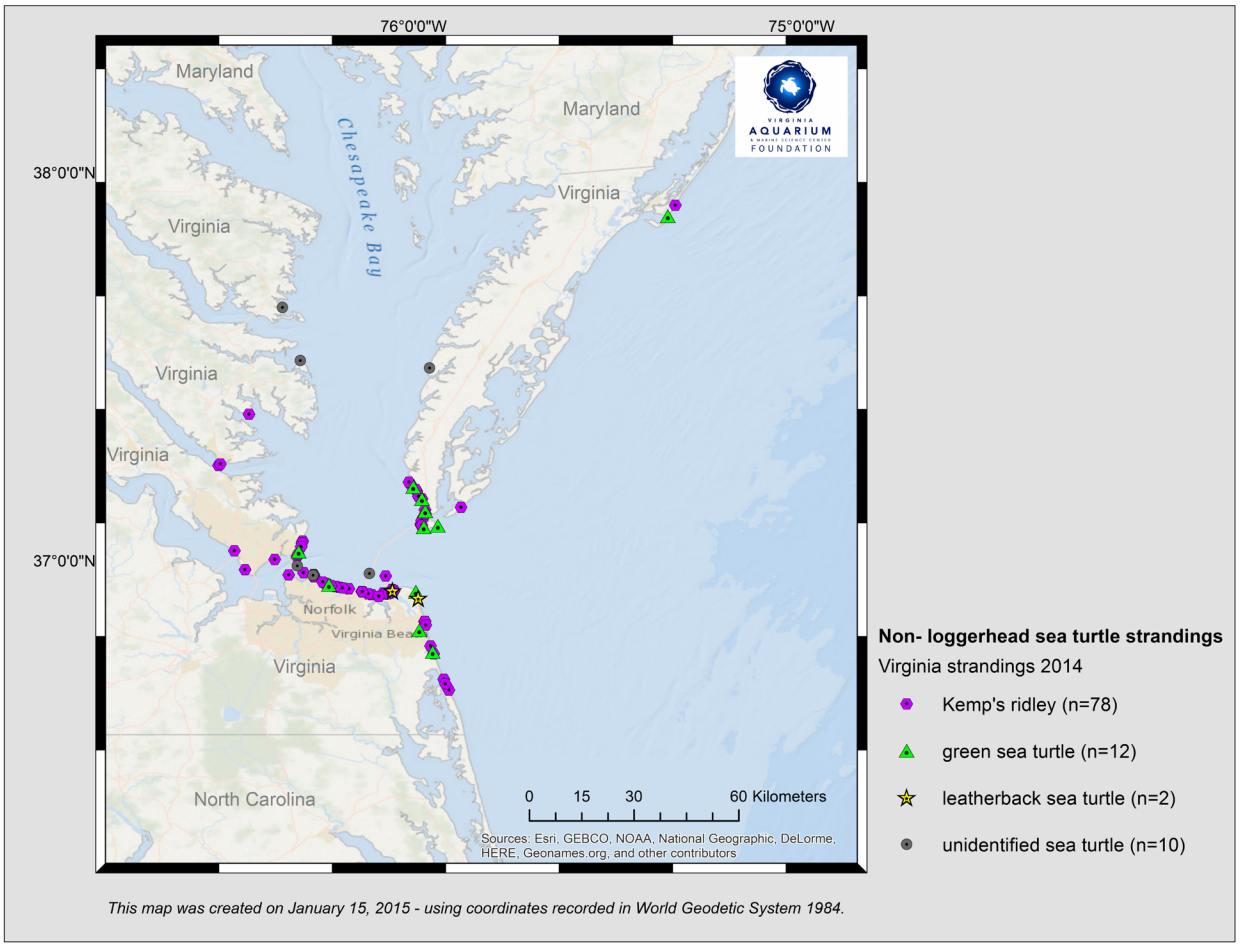



Figure 11: Location of Virginia non-loggerhead sea turtle strandings from 2014.

## Appendix I: Professional and Education Activities

### Educational Activities

| Description | Date | Attendance |
|---|---|---|
| **Outreach Opportunities** | | |
| New Castle Elementary Ecology Club | 1/6/14 | 25 |
| Winter Wildlife Festival | 1/25/14 | 200-300 |
| Reptile Weekend | 2/15-2/16/14 | 2300 |
| ODU Marine Bio Club 5k | 4/13/14 | ND |
| Seatack Elementary Earth Day PTA | 4/22/14 | 100 |
| Earth Day at Mount Trashmore | 5/3/14 | 9000 |
| May Day Event | 5/10/14 | ND |
| Tidewater Master Naturalists Class | 5/12/14 | 26 |
| 5 turtle release (FLSP) | 6/22/14 | 100 |
| Shredder | 6/26/14 | 100 |
| ROMEO breakfast | 6/26/14 | 20 |
| Turtle Release | 8/18/14 | 500 |
| Turtle Release - Boston, Gaston, Maleficent | 9/5/14 | 300 |
| Lion's Club Dinner | 9/23/14 | 25 |
| Cape Henry Women's Club | 10/9/14 | 20 |
| Eastern Shore Birding and Wildlife Festival | 10/11/14 | 100 |
| Tidewater Master Naturalists Class | 10/15/14 | 22 |
| Turtle Release - Loki, Lex Luther, Wolverine | 10/20/14 | 200 |
| Holiday Gift Back Night | 12/14/14 | ~100 |
| **Public Presentations** | | |
| Bottlenose dolphin UME, Invited talk | 2/6/14 | 60 |
| Rotary Club Meeting | 2/27/14 | 25 |
| Oceans Frontier II Movie and Panel Discussion | 3/18/14 | 100 |
| Aquarium Connection Meeting | 3/19/14 | 50 |
| Bottlenose dolphin UME, Invited talk | 6/4/14 | 40 |
| Presentation on the Stranding Team to Capital Group | 7/22/14 | 25 |
| Presentation to the VAQ Volunteer League | 8/11/14 | 60 |
| Science of Oil Spill Lecture | 11/20/14 | 40 |
| Coast Guard Lecture | 11/21/14 | 40 |
| **Stranding Center Tours & Group Presentations** | | |
| SWAT Camp | 7/1/14 | 20 |
| SWAT Camp | 7/15/14 | 20 |
| SWAT Camp | 7/29/14 | 20 |
| MM Teacher Training Tour | 7/22/14 | ND |
| Volunteer League Guest Speaker - Pier Partners Program | 11/13/14 | 30* |
| Deputy City Manager Tour | 12/5/14 | 3 |
| **Virginia Aquarium Talks and Events** | | |
| Volunteer Open House | 1/23/14 | ND |
| Annual VAQS Volunteer Business Meeting and Party | 3/14/14 | 100 |
| Volunteer Open House | 9/25/14 | ND |

**Appendix I: Professional and Education Activities *cont.***

| Description | Date | Attendance |
|---|---|---|
| **Virginia Aquarium Talks and Events *cont.*** | | |
| Virginia Science Festival | 10/4/14 | ND |
| | | |
| **Staff Training** | | |
| Tursiops Prey ID Workshop | 1/6-1/10/14 | 5 |
| Live Cetacean Response Training | 2/8/14 | 18 |
| Respiratory Safety Training | 3/18/14 | 50 |
| IFAW Live Cetacean Response Cross-training | 3/31-4/2/14 | 2 |
| Humpback photo-Id and matching at College of the Atlantic | 7/7-7/12/14 | 2 |
| Field Data Management using MS Access | 11/19-11/23/14 | 20 |
| | | |
| **Stranding Response Team and Cooperator Trainings** | | |
| Marine Mammal/Sea Turtle Natural History Training | 3/19 & 29/14 | 60 |
| Hands on Response Training | 4/5-4/12/14 | 64 |
| Cooperator Training | 5/7/14 | 25 |
| Stranding Volunteer Training | 11/19/14 | 40 |
| Stranding Volunteer Training | 11/22/14 | 30 |
| Whale Whate Photo ID Volunteer Training | 12/4/14 | 50 |
| | | |
| **Other** | | |
| New England Aquarium Cold Stun Event Assistance | 12/1-12/5 | 2 |
| New England Aquarium Cold Stun Event Assistance | 12/4-12/12 | 1 |
| New England Aquarium Cold Stun Event Assistance | 12/11-12/16 | 1 |
| New England Aquarium Cold Stun Event Assistance | 12/15-12/19 | 1 |

*attendance is estimated

**Scientific Conferences, Professional Meetings and Workshops**

- John H. Prescott Marine Mammal Stranding Grant Reviews, 1/13-1/14/14, Webinar
- Atlantic States Marine Fisheries Commission, ACCSP By-catch Prioritization Committee Annual Meeting, 1/15/2014, Webinar
- Virginia Sea Grant Symposium, 1/23/2014, Richmond, VA
- Virginia Marine Debris Reduction Plan Project Leadership Team Meeting, 2/7/2014, Richmond, VA
- Celebrate Sea Turtles Educators Conference, 3/1/14, Virginia Beach, VA
- Sea Turtle Planning and Conservation Meeting, 3/4-3/5/14, Virginia Beach, VA
- Annual Review Meeting for NAVY Monitoring in the Atlantic, 3/10-3/11/14, Virginia Beach, VA
- Mid-Atlantic Regional Planning Body Public Listening Session, 3/20/14, Norfolk, VA
- Associations of Zoos and Aquariums Mid-Year Meeting, 3/23-3/26/14, Memphis, TN
- Bottlenose Dolphin Take Reduction Team Meeting, 3/26/14, Webinar
- Round-table Offshore Wind Energy Discussion, 3/26/14, Virginia Beach, VA
- Southeast and Mid-Atlantic Marine Mammal Symposium, 3/28-3/30/14, Wilmington, NC
- Alliance of Marine Mammal Parks and Aquariums Annual Meeting, 4/2-4/5/14, National Harbor, MD

**Appendix I: Professional and Education Activities *cont.***

- Bureau of Ocean Energy Management Public Comment Session for Offshore Wind, 4/3/14, Virginia Beach, VA
- International Sea Turtle Symposium, 4/11-4/18/2014, New Orleans, LA
- Marine Mammal Commission Annual Meeting, 5/6-5/7/14, Washington DC
- Tech Surge Conference, 6/3-6/4/14, Norfolk, VA
- Virginia/Maryland Sea Turtle Conservation Plan Workshop, 6/17-6/18/14, Virginia Beach, VA
- Virginia Marine Debris Reduction Plan Project Leadership Team Meeting, 7/22/2014, Richmond, VA
- START Team Annual Meeting, 8/4-8/6/14, Riverhead, NY
- Associations of Zoos and Aquariums National Conference, 9/13-9/18/14, Orlando, FL
- Greater Atlantic Region Stranding Network Meeting, 9/23-9/26/14, Mystic, CT
- International Symposium on the Kemp's Ridley Sea Turtle, 11/17-11/19/14, Brownsville, TX
- International User Conference on ARGOS Wildlife Applications, 11/18-11/20/14, Baltimore, MD
- United Nations Environment Programme Convention on Biological Diversity, Expert Workshop on the Impacts of Marine Debris, 12/2-12/4/14, Baltimore, MD
- Virginia Coastal Zone Management Program, Coastal Partners Workshop, 12/10-12/11/14, Richmond, VA
- Virginia Offshore Wind Technology Advancement Project (VOWTAP) Comment Session, 12/17/14, Virginia Beach, VA

**Scientific Publications and Presentations**

Barco, S.G., L. Burt, G.G. Lockhart, R.A. DiGiovanni Jr., A.C. DePerte, R. Boettcher, W.M. Swingle. 2014. Abundance estimates for sea turtles in Chesapeake Bay and offshore waters of Virginia and Maryland. Presented at the 35th Annual Symposium on Sea Turtle Biology and Conservation, April 10-17, New Orleans, LA.

Bates, E.B., S.G. Barco, A.M. Costidis, K.R. Rodrique, K.H. Wetzler MD. 2014. Wolverine: The Recovery, Diagnosis and Treatment of a Juvenile Loggerhead (*Caretta caretta*) with Penetrating Blunt Force Trauma to the Head. Oral presentation at 2014 Greater Atlantic Region Stranding Conference, September 24-26, Mystic, CT.

Byrd, B. L., A. A. Hohn, G. N. Lovewell, K. M. Altman, S. G. Barco, A. Friedlaender, C. A. Harms, W. A. McLellan, K. T. Moore, P. E. Rosel, V. G. Thayer. 2014. Strandings Illustrate Marine Mammal Biodiversity and Human Impacts off the Coast of North Carolina, USA. Fishery Bulletin 112:1-23.

Lockhart, G.G., Barco, S.G., D'eri, L. 2014. A Preliminary Home-Range Analysis of Loggerhead Sea Turtles Released in Virginia, USA. Poster Presentation to the 34th Annual Symposium on Sea Turtle Biology and Conservation, April 10-17, New Orleans, LA.

Lockhart, G.G. and Barco, S.G. 2014. Defining Loggerhead Sea Turtle (*Caretta caretta*) Intensive Use Areas: A Cumulative Analysis of Seasonal Utilization Distributions. Oral Presentation to the Internal User Conference on Argos Wildlife Applications, November 18-20, Baltimore, MD.

Mallette S.D., Lockhart G G., Bort J.E., Rabon A., McAlarney R.J., Cummings E.W., Pabst D. A., McLellan W. A., Barco S.G. 2014. A review of large whale survey effort off the coast of Virginia utilizing multiple research platforms. Oral presentation at the Southeast and Mid-Atlantic Marine Mammal Symposium, March 28-30, Wilmington, NC.

**Appendix I: Professional and Education Activities *cont.***

McLellan, W. A., Arthur, L. H., Mallette, S. D., Thornton, S. W., McAlarney, R. J., Read, A. J., Pabst, D. A. 2014. Longline Hook Testing in the Mouths of Pelagic Odontocetes. ICES Journal of Marine Science. http://icesjms.oxfordjournals.org/cgi/reprint/fsu181?ijkey =pTAKnllRkQeOxfI&keytype=ref

Mallette S. D., Lockhart G. G., McAlarney R. J., Cummings E. W., McLellan, W. A., Pabst, D. A. and Barco, S. G. 2014. Documenting Whale Migration off Virginia's Coast for Use in Marine Spatial Planning: Aerial and Vessel Surveys in the Proximity of the Virginia Wind Energy Area (VA WEA). VAQF Scientific Report 2014-08, 89 pp.

Mallette S. D., Lockhart G G., Bort J. E., Rabon A., McAlarney R. J., Cummings E. W., Pabst D. A., McLellan W. A., Barco S. G. 2014. A review of large whale survey effort off the coast of Virginia utilizing multiple research platforms. Oral presentation at the Southeast and Mid-Atlantic Marine Mammal Symposium, March 28-30, Wilmington, NC .

Mallette, S. D., McLellan, W. A., Scharf, F. S., Koopman, H. N., Barco, S. G., Wells R. S. and Pabst, D. A. Ontogenetic allometry and body composition of the common bottlenose dolphin (*Tursiops truncatus*) from the U.S. Mid-Atlantic. Submitted to Marine Mammal Science (Aug 2014).

Phillips, K., Lynott, M., Barco, S., Fauquier, D., Rotstein, D., DiGiovanni, R., Garron, M., and Goldstein, T. 2014. Bring out your dead: Looking at Virginia's 5-year stranding trends in relation to the 2013 mid-Atlantic *Tursiops* UME. Oral presentation at the Southeast and Mid-Atlantic Marine Mammal Symposium, March 28-30, Wilmington, NC.

Rodrique, K.R., E.B. Bates, S.A. Rose. 2014. The Rehabilitation and Treatment of Sea Turtles Hooked by Recreational Fishermen. Oral presentation at 2014 Greater Atlantic Region Stranding Conference, September 24-26, Mystic, CT.

Rose, S.A., G.G. Lockhart. 2014. You can query it: Using Microsoft Access™ to join multiple sources of sea turtle data. Poster presentation at 2014 Greater Atlantic Region Stranding Conference, September 24-26, Mystic, CT.

Rose, S.A. Virginia Fishing Pier Partners. Oral Presentation to the Virginia Marine Resources Saltwater Recreational Fishing Fund Board, July 14, 2014, Newport News, VA.

Rose, S.A, S.J. Davis, J. Shaffler, S.G. Barco. 2014. Can dead stranded sea turtles yield viable samples for stable isotope analysis? Poster Presentation at 2014 International Sea Turtle Symposium, April 10-17, New Orleans, LA.

Swingle, W.M., Lynott, M.C., Bates, E.B., D'Eri, L.R., Lockhart, G.G., Phillips, K.M., and Thomas, M.D. 2014. Virginia Sea Turtle and Marine Mammal Stranding Network 2013 Grant Report. Final report to the Virginia Coastal Zone Management Program, NOAA CZM Grant #NA12NOS4190122, Task 49. Virginia Aquarium Foundation Scientific Report 2014-02, 49 pp.

Thomas, M.D., S.G. Barco, M.C. Lynott, L.R. D'Eri, H.L. Haas. 2014. Sea turtle condition: a comparison between wild-caught and stranded *Caretta caretta* in Virginia. Poster Presentation to the 34th Annual Symposium on Sea Turtle Biology and Conservation. April 10-17. New Orleans, LA.

Williams, Harvey, and Gulland. 2014. Storage stability of whole blood and serum chemistry variables in California sea lions (*Zalophus californianus*). Oral presentation at the Greater Atlantic Regional Stranding Conference, September 24-26, Mystic, CT.

## Appendix II: Highlights of the year – Marine Mammals

While the state of Virginia and the majority of the east coast remained part of an unusual mortality event affecting bottlenose dolphins, Virginia's marine mammal stranding numbers appeared closer to "normal" in 2014. Bottlenose dolphins (*Tursiops truncatus*) still comprised the majority of our strandings, but numbers were not near those experienced in 2013. Marine mammal highlights from 2014 included a gray seal (*Halichoerus grypus*) pup and three large whale strandings.

VAQS admitted only one seal to rehab in 2014, a young gray seal named Athena. On the morning of 19 March, a member of the public reported a juvenile gray seal hauled out on Sandbridge Beach. VAQS staff and volunteers observed the animal throughout the afternoon and evening, assessing its health and behavior. Ultimately, VAQS made the decision in conjunction with NOAA and the veterinary staff to admit the seal for rehabilitation. The animal presented with mild pneumonia, superficial abrasions and rostral mandibular swelling. VAQS administered oral fluids, systemic antibiotics, and topically treated her wounds. Once the pup was stabilized, staff made arrangements to transfer her to the Mystic Aquarium to complete rehabilitation as temperatures in Virginia were on the rise. On 17 July 2014, Athena was released from Narragansett, RI with a flipper tag.

Large whale strandings also took center stage multiple times in 2014. With any threatened or endangered species, the importance of documenting and investigating the stranding circumstances and collecting samples is an opportunity that cannot be missed. On 19 February, the Virginia Marine Resource Commission (VMRC) reported a dead fin whale (*Balaenoptera physalus*) in Pocomoke Sound near Great Fox Island. The whale was stranded on a sandbar. Due to the location of the animal and no suitable area to land the animal, VAQS made arrangements for "at-sea" examination on 22 February. VMRC played a pivotal role in the assessment and necropsy examination of this whale by providing transportation to this remote stranding. VAQS and staff from the Virginia Department of Game and Inland Fisheries (VDGIF) and the Smithsonian's National Museum of Natural History were able to conduct a necropsy from vessels provided by VMRC. Although some areas of abrasion and lacerations externally suggested possible vessel strike, there were no areas of hemorrhage or broken bones observed on the left side (right side could not be examined). The most interesting finding was an area of possible infection cranial to the kidneys within the vessels. Due to the position of the animal and the inability of the team to bring this animal to dry ground, the necropsy was very limited and hindered the evaluation of the cause of stranding for this animal. Histopathology could not definitively determine a cause of death and findings included ante-mortem abrasions and renal vascular *Crassicaudiasis*.

**Appendix II: Highlights of the year – Marine Mammals *cont.***

On 14 August, the US Coast Guard (USCG) observed a sei whale (*Balaenoptera borealis*) swimming between the Monitor Merrimac Bridge Tunnel and the Hampton Roads Bridge Tunnel in the James River. Over the next several days, the animal slowly moved into the Elizabeth River where VAQS monitored the animal. Multiple agencies offered their assistance in monitoring the animal and monitoring vessel traffic. On 20 August, the animal stranded on a shallow, muddy shoal in the southeastern branch of the Elizabeth River. Attempts from the Chesapeake Police Department (CPD) and VMRC to dislodge the animal using boat wakes were unsuccessful. NOAA-OLE, VMRC, Chesapeake Police Department, TowBoat USA, and NMFS agreed to observe the whale in shifts throughout the night and into the next morning. During the evening, the whale apparently dislodged itself from the shoal, as it could no longer be found. The whale was found dead the following day on St. Julien's Creek. VAQS arranged and participated in the towing of the animal to Craney Island where they conducted a necropsy. The preliminary cause of death determined on gross necropsy was debilitation due to plastic ingestion, leading to a moribund animal that was struck by a vessel while in the Elizabeth River.

Lastly, in December, VAQS staff responded to a dead minke whale (*Balaenoptera acutorostrata*) stranded on Dam Neck Naval Base. The Dam Neck Conservation Officer reported this animal on 24 December. VAQS staff collected Level A information, morphometric data and photographs and arranged for heavy equipment to tow the animal above the high tide line. Due to the holiday, VAQS conducted a necropsy on 26 December. Staff documented healing lesions consistent with an inactive entanglement at the mouth, palate and head. Additionally, the animal exhibited areas of hemorrhage and broken ribs and vertebrae. Histopathology results are pending.

## Appendix III: Highlights of the year - Sea Turtles

The Virginia Aquarium found itself busy, or you could say *hooked,* on sea turtles in 2014. Twenty five sea turtles were reported hooked by fisherman in 2014. From 2002 to 2012, the Virginia Aquarium Stranding Response Team (VAQS) responded to an average of seven sea turtles incidentally captured (hooked) by recreational fishermen annually. In the past two years, 2013 and 2014, VAQS recorded a dramatic increase in the number of reported incidental captures. As VAQS ramped up their outreach efforts on fishing piers as a result of increased observations, the summer months brought dozens of calls of turtles that were captured by recreational fisherman on local piers. Due to the specifically targeted outreach audience and the overwhelming support of pier staff and fishers, VAQS successfully recovered 71% of all hooked turtles reported in 2014 (as opposed to 47% in 2013). By increasing successful response to hook interactions, VAQS aims to reduce injury to individual turtles and collect data to mitigate harmful hook interactions and inform future management of recreational fisheries.

While hook interactions slowed down as turtles headed out of the Chesapeake Bay, November brought VAQS more turtle work, just not in Virginia. As the Cape Cod sea turtle stranding response networks were faced with the largest cold-stun event in their history, help was sought from agencies throughout the country. Every year some sea turtles that spend their summer in Cape Cod Bay stay too long and get cold-stunned. This happens in Virginia too but on a much smaller scale. Cold-stunning occurs when the body temperature of cold-blooded sea turtles falls below 55$^{o}$F causing them to go into a coma-like state. A 'normal' cold stun season in New England results in 80-100 live turtles that need care. The record prior to this year was around 250 live turtles. This year, there were more than 250 in one week in November and current estimates have the total for this season at over 1200!

In November, the Virginia Aquarium's Stranding Response Program (VAQS) began sending staff to assist the New England Aquarium (NEAq), the facility that provides rehabilitation for sea turtles in this region. When our staff arrived at NEAq, the live turtle count was over 600! The turtles were cared for in an offsite building much like the Aquarium's Marine Animal Care Center. VAQS staff, Susan Barco, Kris Williams, Erin Bates, Krystle Rodrique and Sarah Rose joined the NEAq staff and volunteers spending 10-14 hours per day in constant motion. They assisted with check-ins for new turtles, feeding, treatments, cleaning, arranging transports, basically whatever was needed by the amazing NEAq staff.

During this large scale stranding event, at least 20 facilities throughout the eastern U.S., including the Virginia Aquarium, also accepted turtles for rehabilitation. VAQS received 10 juvenile Kemp's ridleys which presented with pneumonia and frostbite lesions. After much hardwork by the VAQS staff and volunteers, these turtles are on the road to recovery with most of their lesions healing and many gaining quite the voracious appetites. During the 2013 dolphin die-off, the Virginia Aquarium Stranding Response Team received similar help, for which we were grateful. It has been important to our team to be able to give back to the folks in our stranding network like the New England Aquarium.

## Appendix IV: Stranding Network Datasheets

### A: Marine Mammal Level A Datasheet

**MARINE MAMMAL STRANDING REPORT - LEVEL A DATA**

**FIELD #:** VAQS2014 **NMFS REGIONAL #:** _____ (NMFS USE) **NATIONAL DATABASE#:** _____ (NMFS USE)

**COMMON NAME:** _____ **GENUS:** _____ **SPECIES:** _____

EXAMINER Name: _____ Affiliation: Virginia Aquarium Stranding

Address: 717 General Booth Blvd, Virginia Beach, VA 23451 Phone: 757-385-7575

Stranding Agreement or Authority: Virginia Aquarium Stranding

**LOCATION OF INITIAL OBSERVATION**

State: _____ County: _____
City: _____
Body of Water: _____
Locality Details: _____
_____
Lat (DD): _____ . _____ N
Long (DD): _____ . _____ W
☐ Actual ☐ Estimated

How Determined: (check ONE)
☐ GPS ☐ Map ☐ Internet/Software

**OCURRENCE DETAILS** ☐ Restrand GE# _____ (NMFS Use)
**Group Event**: ☐ YES ☐ NO
If Yes, Type: ☐ Cow/Calf Pair ☐ Mass Stranding # Animals: _____ ☐ Actual ☐ Estimated

**Findings of Human Interaction**: ☐ YES ☐ NO ☐ Could Not Be Determined (CBD)
If Yes, Choose one or more: ☐ 1. Boat Collision ☐ 2. Shot ☐ 3. Fishery Interaction
☐ 4. Other Human Interaction:_____
How Determined (Check one or more): ☐ External Exam ☐ Internal Exam ☐ Necropsy
☐ Other: _____
Gear Collected? ☐ YES ☐ NO Gear Disposition: _____
**Other Findings Upon Level A**: ☐ YES ☐ NO ☐ Could Not Be Determined (CBD)
If Yes, Choose one or more: ☐ 1. Illness ☐ 2. Injury ☐ 3. Pregnant ☐ 4.Other:_____
How Determined (Check one or more): ☐ External Exam ☐ Internal Exam ☐ Necropsy
☐ Other: _____

**INITIAL OBSERVATION**

Date: Year: 2014 Month: _____ Day: _____
First Observed: ☐ Beach or Land ☐ Floating ☐ Swimming

**CONDITION AT INITIAL OBSERVATION** (Check ONE)
☐ 1. Alive ☐ 4. Advanced Decomposition
☐ 2. Fresh dead ☐ 5. Mummified/Skeletal
☐ 3. Moderate decomposition ☐ 6. Condition Unknown

**LEVEL A EXAMINATION** ☐ Not Able to Examine

Date: Year: 2014 Month: _____ Day: _____

**CONDITION AT EXAMINATION** (Check ONE)
☐ 1. Alive ☐ 4. Advanced Decomposition
☐ 2. Fresh dead ☐ 5. Mummified/Skeletal
☐ 3. Moderate decomposition ☐ 6. Unknown

**INITIAL LIVE ANIMAL DISPOSITION** (Check one or more)
☐ 1. Left at Site ☐ 6. Euthanized at Site
☐ 2. Immediate Release at Site ☐ 7. Transferred to Rehabilitation:
☐ 3. Relocated Date: Year:_____ Month:_____Day:___ Facility:_____
☐ 4. Disentangled ☐ 8. Died during Transport
☐ 5. Died at Site ☐ 9. Euthanized during Transport
☐ 10. Other:_____

**CONDITION/DETERMINATION** (Check one or more)
☐ 1. Sick 7. Location Hazardous
☐ 2. Injured ☐ a. To animal
☐ 3. Out of Habitat ☐ b. To public
☐ 4. Deemed Releasable ☐ 8. Unknown/CBD
☐ 5. Abandoned/Orphaned ☐ 9.Other_____
☐ 6. Inaccessible _____

**MORPHOLOGICAL DATA**

**SEX** (Check ONE)
☐ 1. Male
☐ 2. Female
☐ 3. Unknown

**AGE CLASS** (Check ONE)
☐ 1. Adult ☐ 4. Pup/Calf
☐ 2. Subadult ☐ 5. Unknown
☐ 3. Yearling

☐ Whole Carcass ☐ Partial Carcass

Straight length:_____ ☐ cm ☐ in ☐ actual ☐ estimated
Weight:_____ ☐ kg ☐ lb ☐ actual ☐ estimated

**PHOTOS/VIDEOS TAKEN:** ☐ YES ☐ NO
Photo/Video Disposition: _____
_____

**TAG DATA** Tags Were:
Present at Time of Stranding (Pre-existing): ☐ YES ☐ NO
Applied during Stranding Response: ☐ YES ☐ NO

| ID# | Color | Type | Placement* (Circle ONE) | Applied | Present |
|---|---|---|---|---|---|
| | | | D DF L LF LR RF RR | ☐ | ☐ |
| | | | D DF L LF LR RF RR | ☐ | ☐ |
| | | | D DF L LF LR RF RR | ☐ | ☐ |

* D= Dorsal; DF= Dorsal Fin; L= Lateral Body
LF= Left Front; LR= Left Rear; RF= Right Front; RR= Right Rear

**CARCASS STATUS** (Check one or more)
☐ 1. Left at Site ☐ 4. Towed: Lat_____Long_____ ☐ 7. Landfill
☐ 2. Buried ☐ 5. Sunk: Lat_____Long_____ ☐ 8. Unknown
☐ 3. Rendered ☐ 6. Frozen for Later Examination ☐ 9. Other_____

**SPECIMEN DISPOSITION** (Check one or more)
☐ 1. Scientific collection ☐ 2. Educational collection
☐ 3. Other:_____
Comments: _____
_____

**NECROPSIED** ☐ NO ☐ YES ☐ Limited ☐ Complete
☐ Carcass Fresh ☐ Carcass Frozen/Thawed

**NECROPSIED BY:** _____
**Date: Year:** _____ **Month:**_____ **Day:**_____

NOAA Form 89-864; OMB No.0648-0178; Expires 01/31/2014 PLEASE USE THE BACK SIDE OF THIS FORM FOR ADDITIONAL REMARKS

B: Sea Turtle Level A Datasheet

# SEA TURTLE STRANDING AND SALVAGE NETWORK – STRANDING REPORT

**OBSERVER'S NAME / ADDRESS / PHONE:**
First _____ M.I.____ Last _____
Affiliation: Virginia Aquarium Stranding Response Program
Address: 717 General Booth Blvd, Virginia Beach, VA 23451
vaqstranding@gmail.com
Area code/Phone number: 757-385-7575

**STRANDING DATE:**
Year 20☐☐ Month ☐☐Day☐☐
Turtle number by day ☐☐

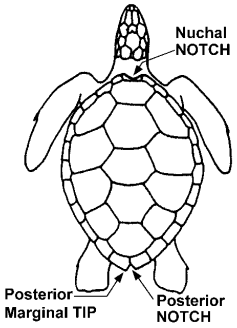
***-State coordinator must be notified within 24 hrs; this was done by ☐phone (757)385-7575 ☐email ☐fax (757)437-4933***

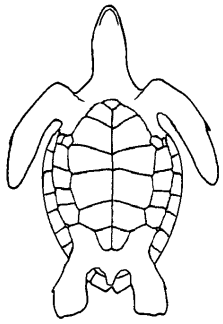
**SPECIES: (check one)**
- ☐ CC = Loggerhead
- ☐ CM = Green
- ☐ DC = Leatherback
- ☐ EI = Hawksbill
- ☐ LK = Kemp's Ridley
- ☐ LO = Olive Ridley
- ☐ UN = Unidentified

***Check Unidentified if not positive. Do Not Guess.***

Carcass necropsied? ☐Yes☐No
Necropsied By_____
Necropsy Date _____
Photos taken? ☐Yes ☐No
Species verified by state coordinator?
☐ Yes ☐ No Initial _____

**SEX:**
☐ Undetermined
☐ Female ☐ Male
Does tail extend beyond carapace?
☐ Yes; how far?_____ cm / in
☐ No
How was sex determined?
☐ Necropsy
☐ Tail length (adult only)



**STRANDING LOCATION:** ☐Offshore (Atlantic or Gulf beach) ☐Inshore (bay, river, sound, inlet, etc)
State _____ County_____
Descriptive location (be specific)_____
_____
_____
Latitude _____ Longitude _____

**CONDITION: (check one)**
- ☐ 0 = Alive
- ☐ 1 = Fresh dead
- ☐ 2 = Moderately decomposed
- ☐ 3 = Severely decomposed
- ☐ 4 = Dried carcass
- ☐ 5 = Skeleton, bones only

**TAGS:** ***Contact state coordinator before disposing of any tagged animal!!***
Checked for flipper tags? ☐ Yes ☐ No
**Check all 4 flippers.** If found, record tag number(s) / tag location / return address
_____
_____
_____
PIT tag scan? ☐ Yes ☐ No
If found, record number / tag location
_____
_____
Coded wire tag scan? ☐ Yes ☐ No
If positive response, record location (flipper)
_____
Checked for living tag? ☐Yes ☐ No
If found, record location (scute number & side)
_____

**FINAL DISPOSITION: (check )**
☐1 = Left on beach where found; painted? ☐Yes* ☐No(5)
☐2 = Buried: ☐ on beach / ☐ off beach;
carcass painted before buried? ☐ Yes* ☐ No
☐3 = Salvaged: ☐ all / ☐ part(s), what/why? _____
_____
_____
☐4 = Pulled up on beach/dune; painted? ☐Yes* ☐No
☐6 = Alive, released
☐7 = Alive, taken to rehab. facility, where? _____
_____
☐8 = Left floating, not recovered; painted? ☐Yes* ☐No
☐9 = Disposition unknown, explain _____
_____
***If painted, what color?*** _____

**CARAPACE MEASUREMENTS: (*see drawing*)**

| **Using calipers** | | **Circle unit** |
|---|---|---|
| Straight length (NOTCH-TIP) | _____ | cm / in |
| Minimum length (NOTCH-NOTCH) | _____ | cm / in |
| Straight width (Widest Point) | _____ | cm / in |
| **Using non-metal measuring tape** | | **Circle unit** |
| Curved length (NOTCH–TIP) | _____ | cm / in |
| Minimum length (NOTCH-NOTCH) | _____ | cm / in |
| Curved width (Widest Point) | _____ | cm / in |
| | | **Circle unit** |
| **Weight** ☐ actual / ☐ est. | _____ | kg / lb |

Mark wounds / abnormalities on diagrams at left and describe below (note tar or oil, gear or debris entanglement, propeller damage, epibiota, papillomas, emaciation, etc.). **Please note if no wounds / abnormalities are found.**
_____
_____
_____
_____
_____
_____

## Appendix V: Virginia Species Lists

A. Marine mammal species in stranding records from Virginia, U.S.A. (Virginia Aquarium Marine Mammal Stranding Database 2014, Potter 1991).

| Common Name | Scientific Name | Status |
|---|---|---|
| ***Class: Mammalia*** | | |
| **Order: Sirenia** | | |
| Family: Trichechidae | | |
| Florida manatee | *Trichechus manatus latirostris* | Endangered |
| | | |
| **Order: Cetacea** | | |
| Suborder: Mysticeti | | |
| Family: Balaenidae | | |
| Northern right whale | *Eubalaena glacialis* | Endangered |
| | | |
| Family: Balaenopteridae | | |
| Fin whale | *Balaenoptera physalus* | Endangered |
| Sei whale | *Balaenoptera borealis* | Endangered |
| Bryde's whale | *Balaenoptera brydei* | Uncertain |
| Minke whale | *Balaenoptera acutorostrata* | Common |
| Humpback whale | *Megaptera novaeangliae* | Endangered |
| | | |
| Suborder: Odontoceti | | |
| Family: Physeteridae | | |
| Sperm whale | *Physeter macrocephalus* | Endangered |
| Pygmy sperm whale | *Kogia breviceps* | Uncertain |
| Dwarf sperm whale | *Kogia sima* | Uncertain |
| | | |
| Family: Ziphiidae | | |
| Cuvier's beaked whale | *Ziphius cavirostris* | Uncertain |
| Gervais' beaked whale | *Mesoplodon europaeus* | Uncertain |
| True's beaked whale | *Mesoplodon mirus* | Uncertain |
| Sowerby's beaked whale | *Mesoplodon bidens* | Uncertain |
| Blainville's beaked whale | *Mesoplodon densirostris* | Uncertain |
| | | |
| Family: Delphinidae | | |
| Longfinned pilot whale | *Globicephala melas* | Common |
| Shortfinned pilot whale | *Globicephala macrorhynchus* | Uncommon |
| Risso's dolphin | *Grampus griseus* | Common |
| Bottlenose dolphin | *Tursiops truncatus* | Common |
| Atlantic white-sided dolphin | *Lagenorhynchus acutus* | Common |
| Pygmy killer whale | *Feresa attenuata* | Uncertain |
| Melonheaded whale | *Peponocephala electra* | Uncertain |

A. Marine mammal species *cont.*

| Common Name | Scientific Name | Status |
|---|---|---|
| Family: Delphinidae (cont) | | |
| Rough-toothed dolphin | *Steno bredanensis* | Uncommon |
| Common dolphin | *Delphinus delphis* | Common |
| Striped dolphin | *Stenella coeruleoalba* | Common |
| Pantropical spotted dolphin | *Stenella attenuata* | Common |
| Atlantic spotted dolphin | *Stenella frontalis* | Common |
| | | |
| Family: Phocoenidae | | |
| Harbor porpoise | *Phocoena phocoena* | Common |
| | | |
| **Order: Carnivora** | | |
| Suborder: Pinnipedia | | |
| Family: Phocidae | | |
| Harbor seal | *Phoca vitulina* | Common |
| Gray seal | *Halichoerus grypus* | Common |
| Hooded seal | *Crystophora cristata* | Common |
| Harp seal | *Pagophilus groenlandica* | Common |
| | | |

B. Sea turtle species in stranding records from Virginia, U.S.A. (Virginia Aquarium Sea Turtle Stranding Database 2013).

| Common Name | Scientific Name | Status |
|---|---|---|
| **Class: Reptilia** | | |
| **Order: Testudines** | | |
| Family: Dermochelyidae | | |
| Leatherback sea turtle | *Dermochelys coriacea* | Endangered |
| | | |
| Family: Cheloniidae | | |
| Green sea turtle | *Chelonia mydas* | Threatened |
| Loggerhead sea turtle | *Caretta caretta* | Threatened |
| Hawksbill sea turtle | *Eretmochelys imbricata* | Endangered |
| Kemp's ridley sea turtle | *Lepidochelys kempii* | Endangered |
| | | |