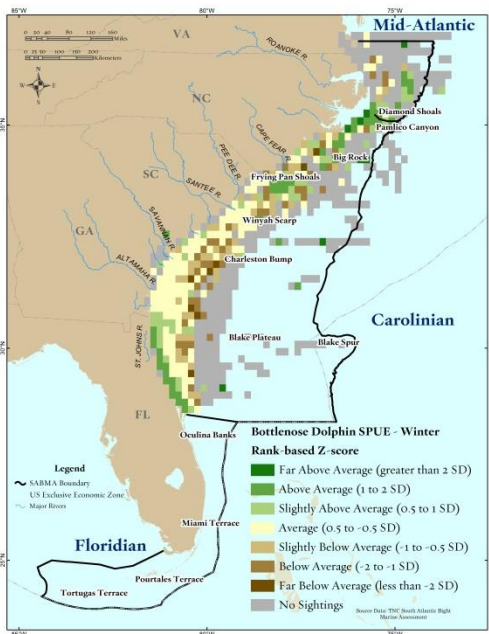


# South Atlantic Bight Marine Assessment (SABMA)

## Marine Mammals and Sea Turtles (MMST) Data Summary

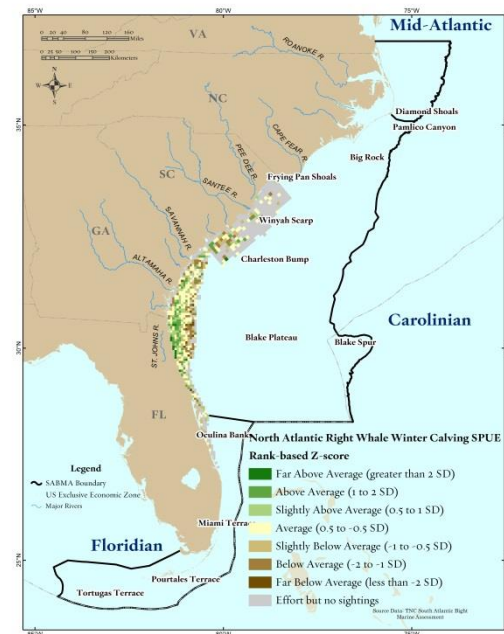


**Project Webpage:**  
<http://nature.ly/marineSAtlanticBightERA>

**MMST Data and Full Metadata:**  
[http://easterndivision.s3.amazonaws.com/Marine/SABMA/SABMAMarineMammals\\_SeaTurtles.zip](http://easterndivision.s3.amazonaws.com/Marine/SABMA/SABMAMarineMammals_SeaTurtles.zip)

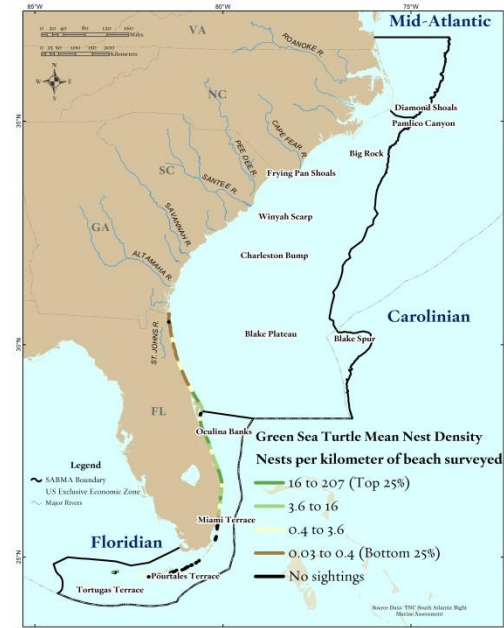
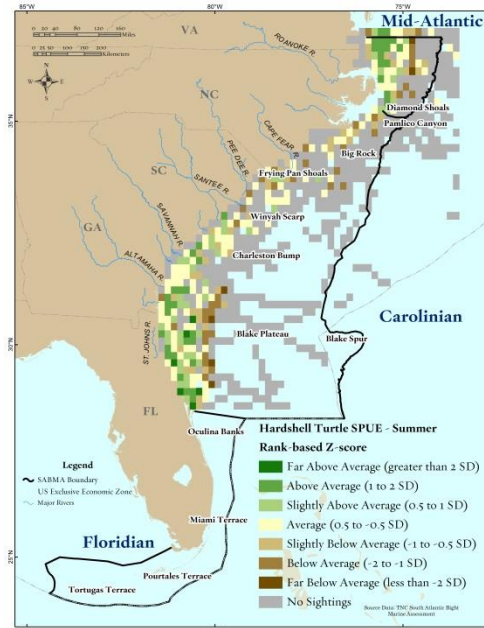
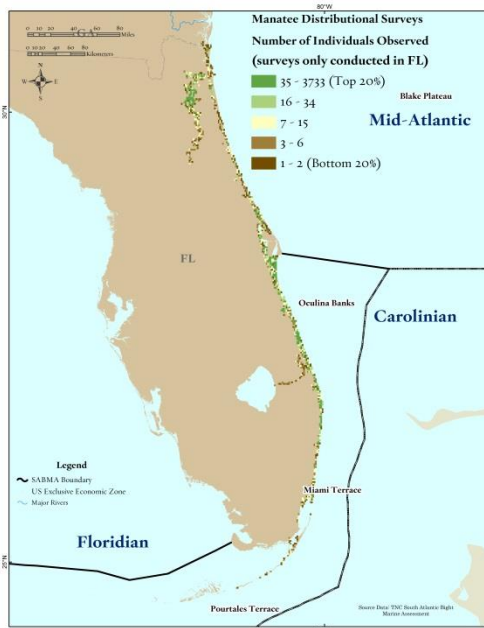
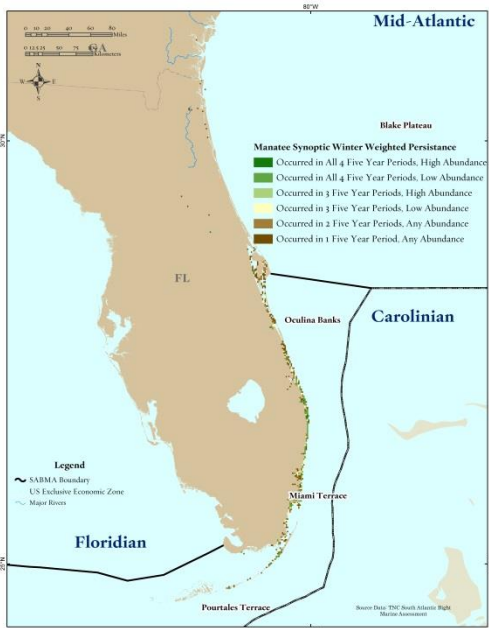
**MMST Chapter:**  
[http://easterndivision.s3.amazonaws.com/Marine/SABMA\\_Chapter04\\_MMST.pdf](http://easterndivision.s3.amazonaws.com/Marine/SABMA/SABMA_Chapter04_MMST.pdf)

**For Questions Please Contact:**  
[eScience@tnc.org](mailto:eScience@tnc.org)



The Nature Conservancy 

Protecting nature. Preserving life.®



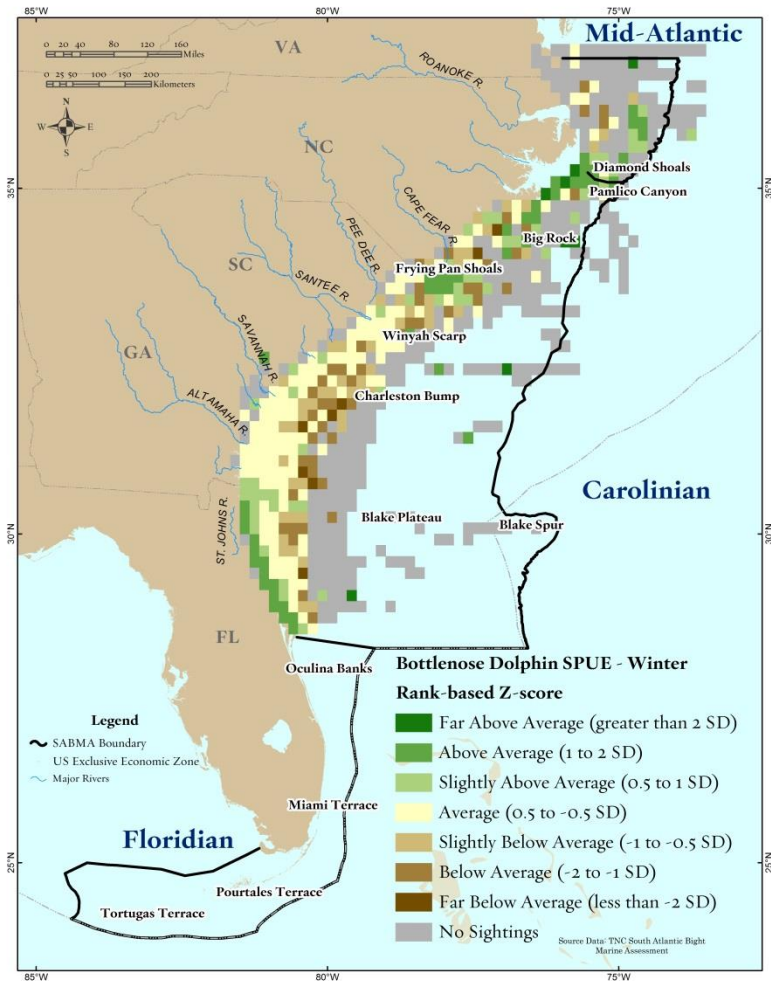
# Marine Mammals Sightings Per Unit Effort (SPUE)

**Data Sources:** Department of the Navy, 2008. Marine Resource Assessment Update for the Virginia Capes Operating Area. Department of the Navy, U.S. Fleet Forces command, Norfolk, Virginia. Contract #N62470-02-D-9997, CTO 0056. Prepared by Geo-Marine Inc., Hampton, Virginia.

**Year:** 2008

## **Dataset Description & Methods Overview:**

This dataset includes sightings per unit effort (SPUE) data for eleven migratory marine mammal species or species groups (Beaked Whales, Bottlenose Dolphin, Fin Whale, Risso's Dolphin, Humpback Whale, Pilot Whales, Common Dolphin, Sperm Whale, oceanic dolphins (Atlantic spotted dolphin, pantropical spotted dolphin, striped dolphin and unidentified *Stenella spp.*)) within the SABMA project area as well as the underlying effort information used in developing the SPUE model. This effort-corrected sightings data compilation was originally modeled by the U.S. Navy for a selection of their Marine Resource Assessments (MRA) along the Atlantic coast. Each polygon within this dataset is a ten minute square (TMS) size grid cell used as the analysis unit in the SPUE model. SPUE is an index of relative density that allows for comparison of data spatially and temporally within a study area (Shoop and Kenney 1992). In this model, SPUE is equal to  $1000 * [(number\ of\ animals\ sighted) / (number\ of\ kilometers\ surveyed)]$  for each "present" ten-minute square/grid cell. Using that formula, SPUE was then calculated for each target species/species group for all four seasons. The dates used for the seasons are as follows Winter: Dec 6 - April 5, Spring: April 6 - July 13, Summer: Jul 14 - Sept 16, and Fall: Sept 17 - Dec 5. In addition to displaying the raw SPUE grid cell values, users may wish to display the grid cell values in terms of rank-based z-scores. The Nature Conservancy transformed the SPUE grid cell values to rank-based z-scores to show each TMS SPUE value in relation to the mean. While TNC has received permission to use this data for our own assessment purposes please make sure to also cite the data originator(s).



\*See final report and metadata for detailed methods and more information.

For Questions Please Contact: [eScience@tnc.org](mailto:eScience@tnc.org)

# North Atlantic Right Whale Winter Calving Sightings Per Unit Effort (SPUE)

**Data Sources:** Data management: North Atlantic Right Whale Consortium - University of Rhode Island, FWC-FWRI  
Data analysis: FWC-FWRI

**Years:** 1991/1992 to 2013/2014

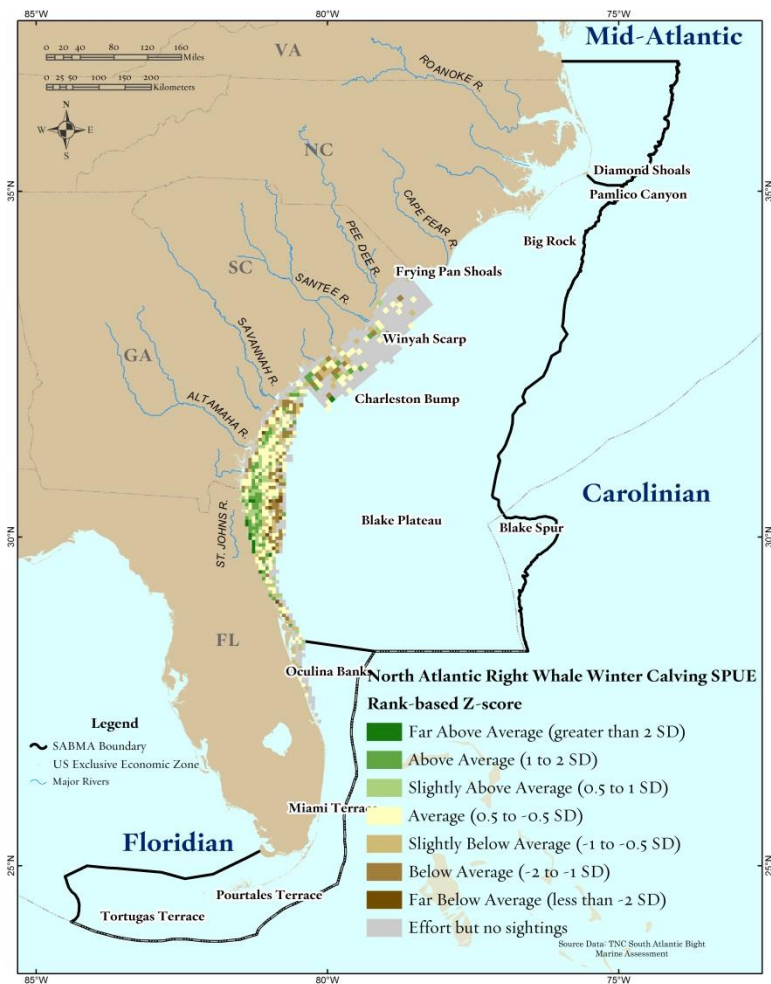
## Dataset Description & Methods Overview:

This dataset was adapted from a spatial database provided by the Florida Fish and Wildlife Conservation Commission (original data provided to the FL FWC by the North Atlantic Right Whale Consortium). The original database was developed using effort-corrected aerial survey data from 1991/1992 to 2013/2014. We have only included those cells with greater than 200 kilometers surveyed to ensure normalized distribution of SPUE values. This data is a polygon feature class with grid cells oriented along the aerial survey track lines representing areas surveyed during the Early Warning System and the South Carolina-Georgia surveys for right whale calving seasons from 1991/1992 to 2013/2014. The east-west grid cells are 3 x 3 nautical miles and northwest-southeast grid cells are 4.06 x 4.06 nautical miles. Attributes include details about cumulative survey effort as length of track surveyed in KM (i.e., linear distance effort) under standard survey effort and cumulative data for whale sightings and sightings per linear unit effort (KM) across the 23 seasons. Only “on track” survey effort is included, i.e., where teams were on a survey trackline and not circling a sighting or in transit. The survey team was considered on-watch under the following conditions for 1991 - 2002 Leg stage 1 or 2, Beaufort Sea State less than or equal to 3, Visibility equal to 1, Altitude less than or equal to 306 and for 2002 - 2014 Leg stage 1 or 2, Altitude less than 366, Visibility less than or equal to 2, and Beaufort less than or equal to 3. In addition to displaying the raw SPUE grid cell values, users may wish to display the grid cell values in terms of rank-based z-scores. The Nature Conservancy transformed the SPUE grid cell values to rank-based z-scores to show each TMS SPUE value in relation to the mean. While TNC has received permission to use this data for our own assessment purposes please make sure to also cite the data originator(s).

\*See final report and metadata for detailed methods

and more information.

*For Questions Please Contact: [eScience@tnc.org](mailto:eScience@tnc.org)*



# Manatee Synoptic Winter Weighted Persistence

**Data Sources:** Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute.

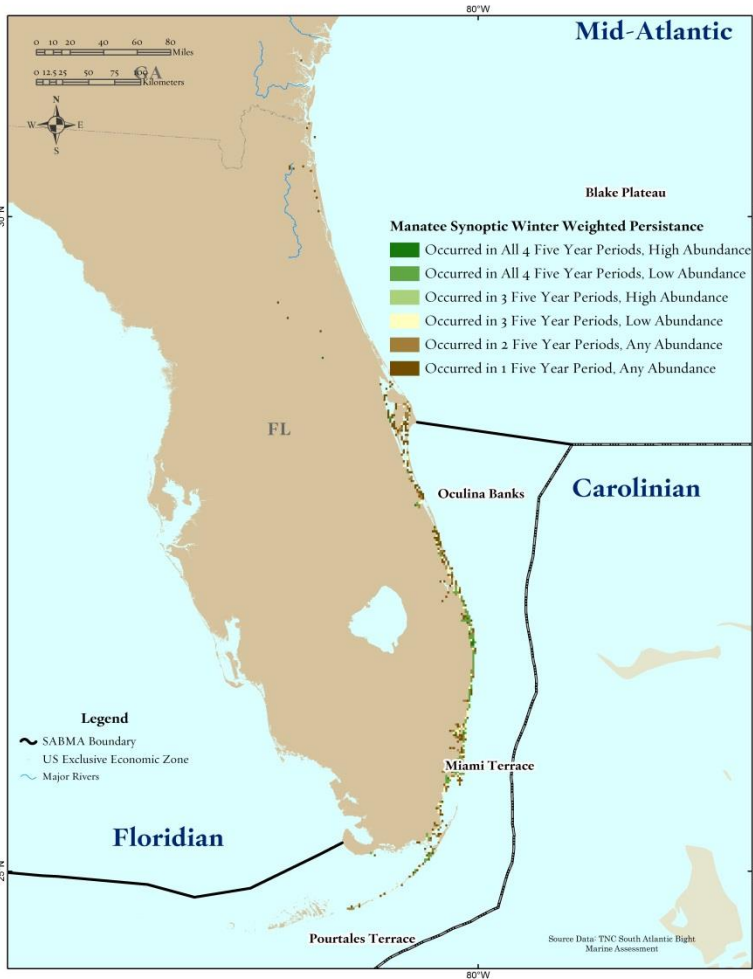
**Years:** 1991-2011

## **Dataset Description & Methods Overview:**

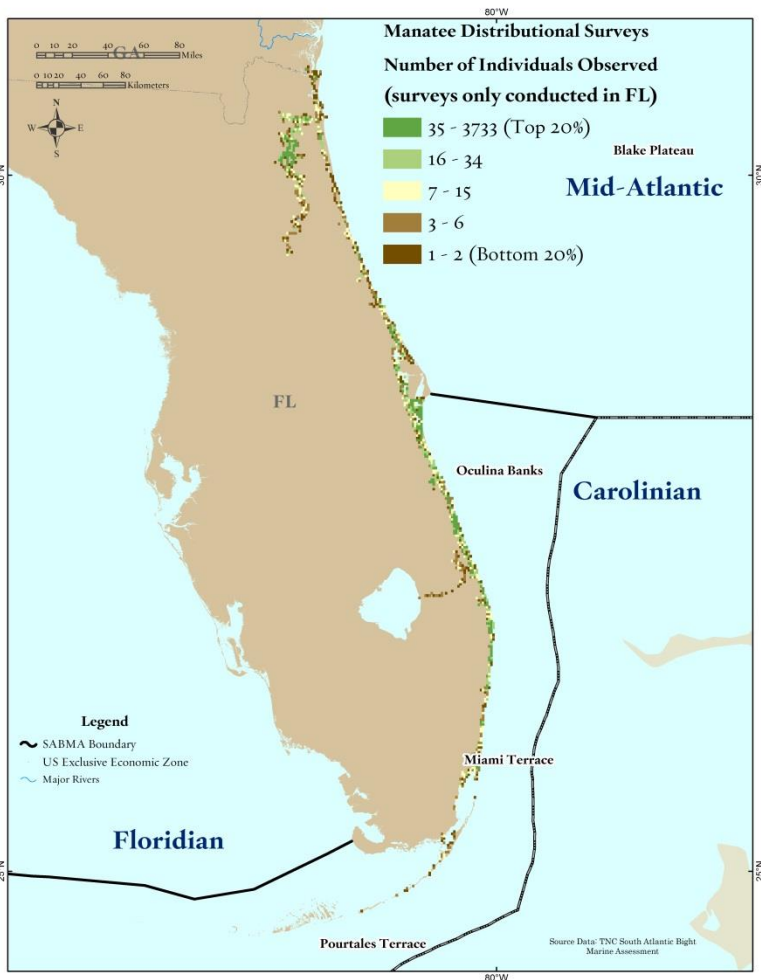
The Florida Fish and Wildlife Conservation Commission (FWC) coordinates an interagency team that conducts aerial manatee synoptic surveys. These statewide interagency surveys take place during the winter months and are conducted after cold fronts pass through Florida when manatees gather at warm springs and thermal discharges from power and industrial plants. Winter synoptic survey data was obtained from the FWC for the years 1991 - 2011, placed into a one minute grid surface. Abundance was calculated for each 1-minute square as the number of individuals sighted in any given 1-minute square over the years 1991-2011. Persistence is the consistency with which a species was observed in the same one minute square over time. The weighted persistence score is a variation of the persistence score in which each 5- year period (i.e., 1991 – 1995, 1996 – 2001, etc.) is weighted by the average abundance of the species over the 5-year period it was present. To be included, a one minute square had to have data from at least one survey point from each of three or four 5-year periods. Because the abundance data were skewed toward low abundances with a few very high abundances, values were log-transformed and mean log abundances were calculated for each 5-year period within each one minute square. These 5-year mean scores were averaged across all decades to obtain a grand average for each one minute square. The grand average was then normalized across all one minute squares for manatees to create a metric of abundance ranging between 0.0 and 1.00, with low abundance defined as 0-0.49 and high abundance defined as 0.50 – 0.99. The weighted persistence score was calculated by adding the persistence and relative average abundance. The integer part of the score is the persistence score while the decimal part of the score is the relative grand average abundance value.

\*See final report and metadata for detailed methods and more information.

*For Questions Please Contact: [eScience@tnc.org](mailto:eScience@tnc.org)*



# Manatee Distributional Surveys: Abundance



**Data Sources:** Manatee Distributional Surveys (1986-2012). Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute. Manatee specific data used in analyses were collected under scientific research permit #MA773494 issued to FWC-FWRI; Manatee Distributional Survey 2009-2011. Palm Beach County, Florida. Gerald Pinto; Manatee Distributional Survey for Duval, Clay and Portions of St. John's Counties. 2002-2014. Jacksonville University.

**Years:** 1986-2014

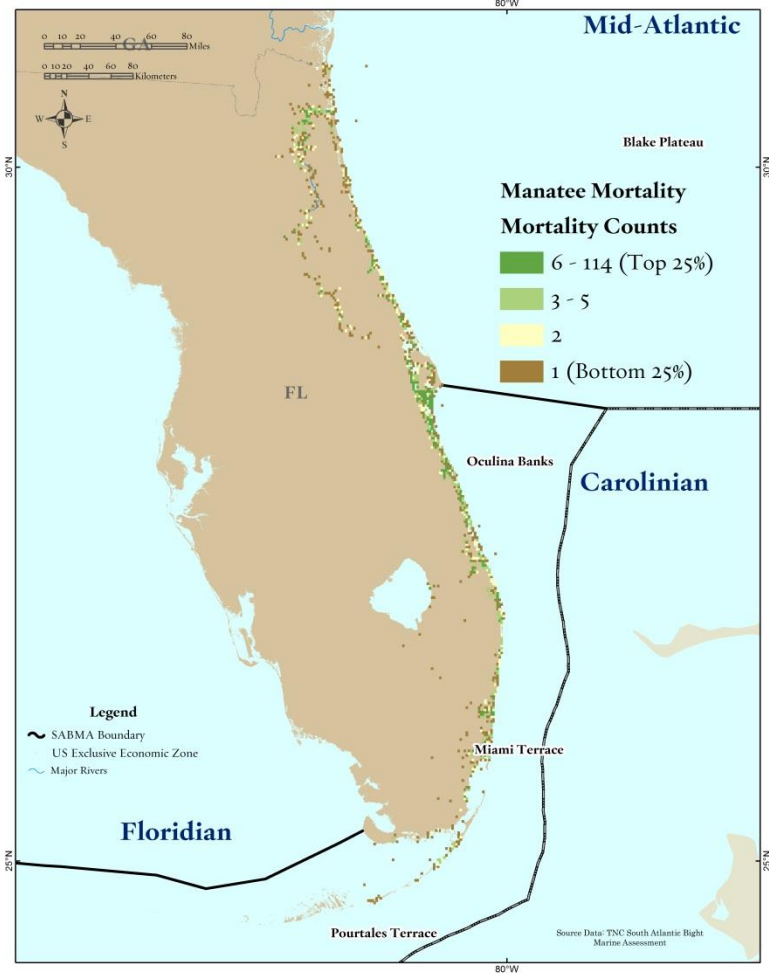
## **Dataset Description & Methods Overview:**

The Florida Fish and Wildlife Conservation Commission (FWC) and other entities (e.g., local governments) use aerial distribution surveys to determine the seasonal distribution and relative abundance of manatees. These surveys are typically conducted in inshore waters around the state on a county-by-county basis. Flights are usually between four and six hours long and are most commonly flown every two weeks for two years. Most of the survey data included in this dataset were collected using small, four-seat, high-winged airplanes (Cessna 172 or 182) flying at a height of 150 m (500 ft) at a speed of 130 km/hr (80 mph). The flights were designed to maximize manatee counts by concentrating on shallow nearshore waters, where manatees and their primary food source, seagrasses, are located. Distributional survey point data was obtained from the FWC for the years 1986-2012, Palm Beach county for the years 2009-2011, and Dr. Gerald Pinto of Jacksonville University for Clay and Duval and portions of St. John's counties for the years 2002-2014. The point data was spatially summarized by a one minute grid surface to calculate manatee abundance as the total number of manatees, adults and calves, observed at each survey point within a one minute grid cell over the years surveyed. There were often multiple surveys conducted over different time periods that occurred within a single one minute grid cell. When this occurred, the most recent survey data was used to calculate manatee abundance.

\*See final report and metadata for detailed methods and more information.

*For Questions Please Contact: [eScience@tnc.org](mailto:eScience@tnc.org)*

# Manatee Mortality



**Data Sources:** Manatee Carcass Recovery Locations in Florida (1974-2012). Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute. Manatee specific data used in analyses were collected under scientific research permit #MA773494 issued to FWC-FWRI.

**Years:** 1974-2012

## **Dataset Description & Methods Overview:**

The Manatee Mortality dataset was adapted from data collected by the Florida Fish and Wildlife Conservation Commission and was provided to The Nature Conservancy for inclusion in its South Atlantic Bight Marine Assessment (SABMA). The purpose of this dataset is to display reported carcass recovery locations by one minute square grid cells. This information may prove helpful in improving the management and siting of marine activities while preserving the long-term integrity of the endangered Florida manatee.

Since 1974, the Florida Fish and Wildlife Conservation Commission (FWC) has collected statistics on manatee mortality throughout Florida. Staff members at field laboratories respond to reports of injured and dead manatees, and transport carcasses to the FWC St. Petersburg laboratory for an assessment of probable cause of death. This dataset includes carcass recovery data ranging from 1974 through 2012. This information is useful for better understanding where manatees are located as well as causes of death and any trends in this data.

The Manatee Carcass Recovery Locations in Florida point data was obtained from the FWC for the years 1974-2012. The point data was spatially summarized by a one minute grid surface to calculate the number of recovered carcasses for each 1-minute square.

\*See final report and metadata for detailed methods and more information.

*For Questions Please Contact: [eScience@tnc.org](mailto:eScience@tnc.org)*

# Sea Turtles Sightings Per Unit Effort (SPUE)

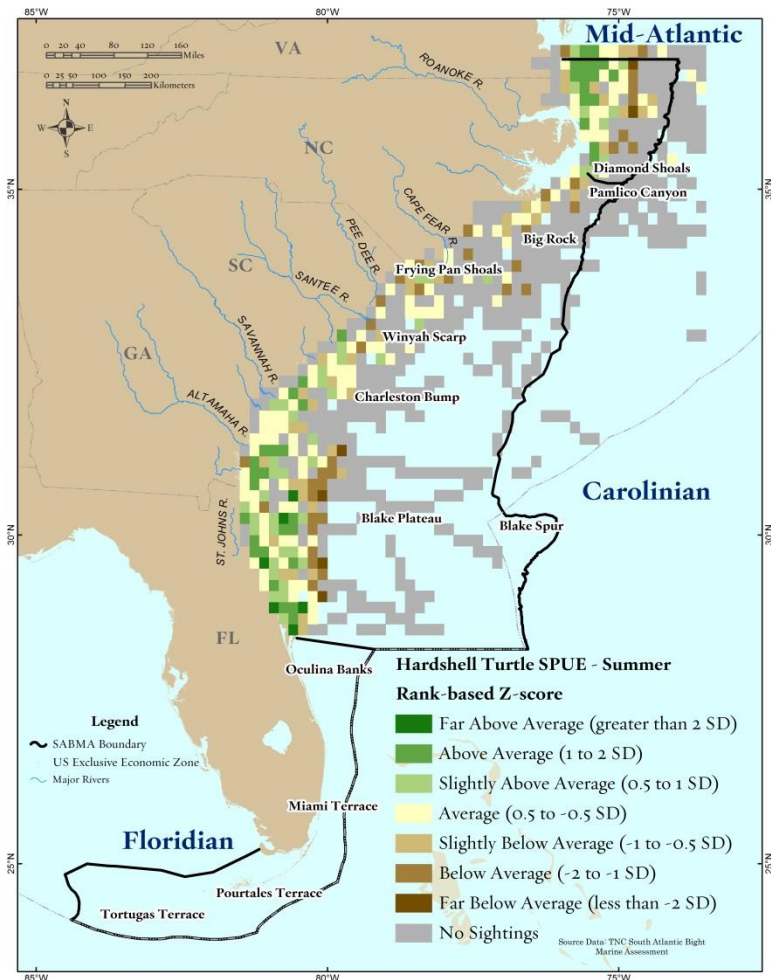
**Data Sources:** Department of the Navy, 2008. Marine Resource Assessment Update for the Virginia Capes Operating Area. Department of the Navy, U.S. Fleet Forces command, Norfolk, Virginia. Contract #N62470-02-D-9997, CTO 0056. Prepared by Geo-Marine Inc., Hampton, Virginia.

**Year:** 2008

## **Dataset Description & Methods Overview:**

This layer includes sightings per unit effort (SPUE) modeled data for two migratory sea turtle species or species groups (leatherback sea turtle, and hardshell sea turtle species (green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, and loggerhead sea turtle) within the SABMA project area as well as the underlying effort information used in developing the SPUE model. This effort-corrected sightings data compilation was originally modeled by the U.S. Navy for a selection of their Marine Resource Assessments (MRA) along the Atlantic coast. Each polygon within this dataset is a ten minute square (TMS) size grid cell used as the analysis unit in the SPUE model. SPUE is an index of relative density that allows for comparison of data spatially and temporally within a study area (Shoop and Kenney 1992). In this model, SPUE is to  $1000 * [(number\ of\ animals\ sighted) / (number\ of\ kilometers\ surveyed)]$  for each "present" ten-minute square/grid cell. Using that formula, SPUE was then calculated for each target species/species group for all four seasons. The dates used for the seasons are as follows Winter: Dec 6 - April 5, Spring: April 6 - July 13, Summer: Jul 14 - Sept 16, and Fall: Sept 17 - Dec 5. In addition to displaying the raw SPUE grid cell values, users may wish to display the grid cell values in terms of rank-based z-scores. The Nature Conservancy transformed the SPUE grid cell values to rank-based z-scores to show each TMS SPUE value in relation to the mean. While TNC has received permission to use this data for our own assessment purposes please make sure to also cite the data originator(s).

\*See final report and metadata for detailed methods and more information.



# Sea Turtles Mean Nest Density (sea turtle nesting dataset)

**Data Sources:** Survey data collection: Florida Fish and Wildlife Conservation's Fish and Wildlife Research Institute – Statewide Nesting Beach Survey program, Georgia Department of Natural Resources, North Carolina Wildlife Resource Commission, South Carolina Department of Natural Resources, Virginia Department of Game and Inland Fisheries

Data analysis: South Carolina Department of Natural Resources – Marine Resource Research Institute

**Years:** 2006-2011; VA: 2008-2013

## **Dataset Description & Methods Overview:**

This dataset shows the distribution of sea turtle nests along surveyed beaches from 2006-2011 (time frame of available data) within the South Atlantic Bight region (except for VA, 2008 to 2013). This sea turtle nesting data was adapted from data collected by the representative state resource agencies from VA, NC, SC, GA and FL. All data was compiled into mean nest density (green, leatherback and loggerhead sea turtles) and presence /absence (hawksbill and Kemp's ridley sea turtles) formats for the Governors' South Atlantic Alliance by the South Carolina Marine Resource Research Institute's GIS program. It was then provided to The Nature Conservancy for inclusion in SABMA. The Florida loggerhead turtle ranking of beaches by nest density was done within four distinct genetic population subunits. In VA, NC, SC, and GA, only loggerhead nest densities are reported in the database and are represented as one genetic population subunit. This dataset does not necessarily include information for all turtle nesting areas on the coast in each state, only those beaches that are routinely monitored. Nest density/km of beach is reported in the database as an average for all years surveyed in the state. Some state data do not include the entire six year time frame. The length of beach surveyed may also vary slightly over the years in some of the states.

\*See final report and metadata for detailed methods and more information.

*For Questions Please Contact: [eScience@tnc.org](mailto:eScience@tnc.org)*

