

## SPERM WHALE (*PHYSETER MACROCEPHALUS*) PRESENCE AND BEHAVIOR OFF THE MID-ATLANTIC STATES OF NORTH CAROLINA AND VIRGINIA FROM 2011 TO 2016

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We have been conducting monthly aerial surveys off North Carolina and Virginia as part of the US Navy's marine species monitoring program in the mid-Atlantic since 2011. Survey tracklines extend from shallow continental shelf waters, across the continental shelf break, to deep pelagic waters. During surveys, we record the geographic position of each marine mammal sighting, and extensively photograph each sighting to document species identification and behavior. From May 2011 through December 2016, 46,598 km of tracklines were flown and 65 sperm whales (*Physeter macrocephalus*) were documented during 37 encounters. All sperm whale sightings were recorded between depths of 500 and 4000 meters. Sightings per 1000 km flown varied across seasons – 0.69 (spring), 1.16 (summer), 0.60 (fall), and 0.17 (winter). Chi-squared analysis also demonstrated a significant difference in the number of individuals sighted across seasons, with highest counts in the summer (n=37) and lowest counts in the winter (n=1),  $X^2, (3, N = 65) = 11.4, p < 0.01$ . Visual sightings of sperm whales will be compared to acoustic detections recorded on High-frequency Acoustic Recording Packages (HARPs) that were deployed off Cape Hatteras. Logging and other behaviors, including surface travel, tail slapping, vertical floating, mouth open, intraspecific body “ramming”, interspecific interactions, and interactions with long-line fisheries, have been documented during these aerial surveys. Although we have observed juveniles and adults (presumed by total length) across seasons, only one calf has been observed. In summer 2013, a single calf was observed swimming in echelon position alongside a larger animal; this sighting was therefore recorded as a mom/calf pair. Thus, sperm whales are found year-round in the deep waters off Virginia and North Carolina, although their abundance varies significantly across seasons. These data can be used to inform any future regulatory actions and habitat protection measures for this endangered species in the mid-Atlantic.