Patterns of cetacean species occurrence, distribution and density at three sites along the continental shelf break of the U.S. Atlantic coast

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As part of the U.S. Navy's Atlantic Fleet Testing and Training program, we are monitoring the occurrence, distribution and density of cetaceans at three offshore sites along the U.S. Atlantic coast. We are using an identical suite of survey methods (line transect surveys, photo-identification, biopsy sampling and passive acoustic monitoring) at each 500nm^2 reference site. Surveys began in Onslow Bay, NC in 2007, Jacksonville, FL in 2009 and Cape Hatteras, NC in 2011. To date we have conducted 48674km, 60687km, and 14213km of aerial surveys with 6883km, 3403km and 2443km of vessel surveys and 1201 days, 1264 days and 28 days of High-frequency Acoustic Recording Package (HARP) recordings at Onslow, Jacksonville and Cape Hatteras, respectively. In both Onslow and Jacksonville, the cetacean fauna is dominated by *Tursiops truncatus,* with densities of 0.034/km^2 and 0.025/km^2 respectively and *Stenella frontalis,* with densities of 0.027/km^2 and 0.045/km^2 respectively. *S. frontalis* was encountered exclusively over the continental shelf. *Grampus griseus* and *Globicephala macrorhynchus* were the most commonly encountered pelagic odontocetes at these two sites. Species richness is much greater at Cape Hatteras than at the two southern sites (with 18 species sighted at Cape Hatteras, 10 at Jacksonville and 9 at Onslow), with the inclusion of several boreal species during colder months and the common occurrence of several deep-diving odontocetes, including *Physeter macrocephalus, Ziphius cavirostris* and *Mesoplodon* spp. Mysticetes, including *Balaenoptera acutorostrata, B. physalus, Eubalaena glacialis,* and *Megaptera novaeangliae,* were encountered only during winter at all three sites. In addition, we have detected the calls of two species on bottom-mounted HARPS that were not observed during visual surveys, including *B. musculus* and likely *B. borealis*. We highlight the particularly high diversity of cetaceans at the Cape Hatteras shelf break and suggest that this is a hotspot of species richness in the North Atlantic.

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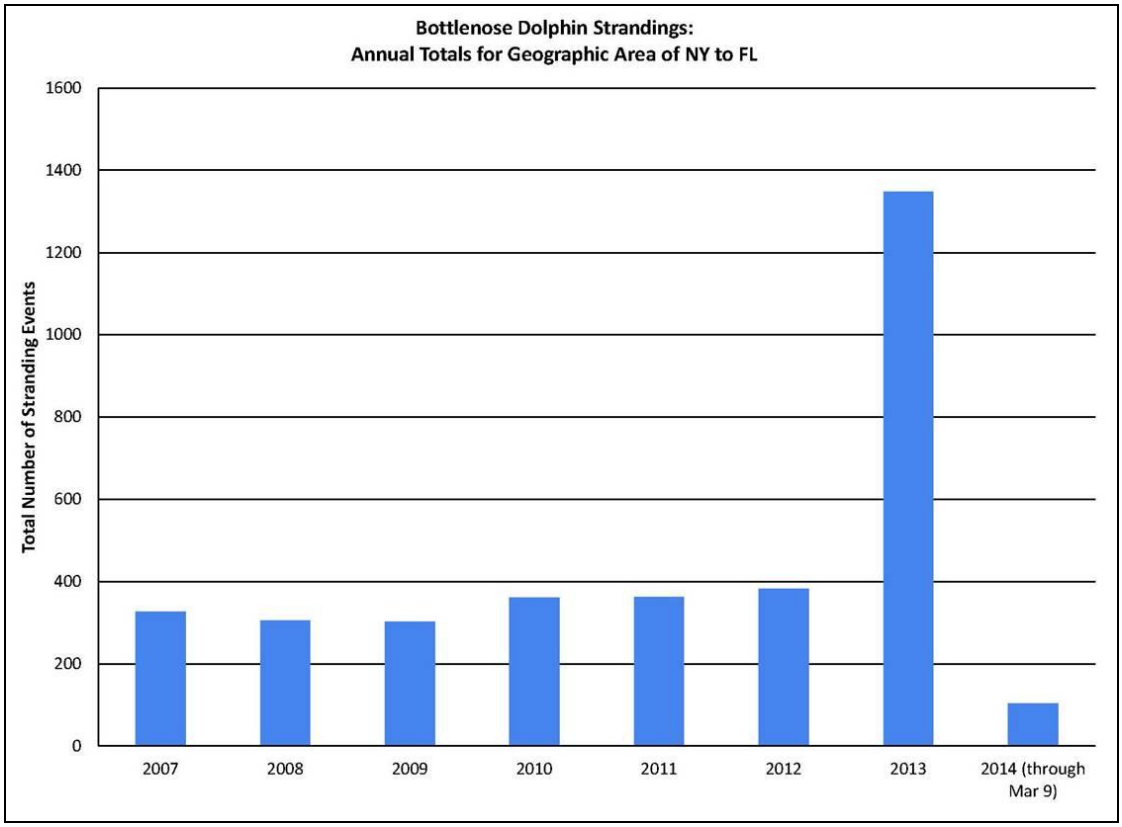
28 – 30 March 2014

University of North Carolina Wilmington



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