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# Species diversity and abundance at a cetacean "hot spot" off Cape Hatteras, North Carolina, USA

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We have been conducting ongoing monthly aerial surveys off Cape Hatteras, NC, USA as part of the US Navy's marine species monitoring program in the Atlantic since 2011. We utilize line transect survey methods and extensively photograph all sightings to confirm species identification. Survey tracklines extend from shallow continental shelf waters, across the shelf break, to deep pelagic waters. From May 2011 through December 2014, 26,131km of trackline were flown, and 9,941 individual cetaceans were documented during 437 encounters. Nineteen species of cetaceans, including three mysticetes (*Balaenoptera physalus*, *B. acutorostrata*, *Megaptera novaeangliae*), five deep-divers (*Physeter microcephalus*, *Kogia* spp., *Ziphius cavirostris*, *Mesoplodon europaeus*, *M. mirus*), and eleven delphinids (*Tursiops truncatus*, *Stenella frontalis*, *S. attenuate*, *S. coeruleoalba*, *S. clymene*, *S. longirostris*, *Steno bredanensis*, *Peponocephala electra*, *Lagenodelphis hosei*, *Grampus griseus* and *Globicephala macrorhynchus*) were encountered. Similar surveys at the adjacent Onslow Bay, NC site yielded only 257 sightings (4,773 individuals representing nine species) despite nearly two times the survey effort flown (48,698km). At Cape Hatteras, minimum abundance estimates (i.e. uncorrected for availability or perception bias) were generated using spatio-temporal density surface modelling for species with sufficient detections. Predicted monthly abundance of *T. truncatus* varied between 170 (95% confidence interval; 0 - 17,100) and 3,450 (300 - 8,510). Monthly *Stenella* spp. abundance varied between 110 (0 - 360) and 1,720 (400 - 5,390). Monthly abundance of *G. macrorhynchus* varied between 10 (0 - 960) and 1,230 (220 - 4,300). These results demonstrate that the waters off Cape Hatteras support both higher diversity and density of cetaceans than adjacent waters along the US Atlantic coast. This site is included in the area of interest identified in six pending permits for large-scale, commercial seismic surveys. We suggest that the high density and diversity of cetaceans at this site warrants a special degree of concern by the US Bureau of Ocean Energy Management.