Passive acoustic monitoring of beaked whales off North Carolina, USA

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Little is known about the ecology, habitat preferences, or seasonal distributions of beaked whale species (family *Ziphiidae*) in the western North Atlantic. Here we present an analysis of passive acoustic monitoring data which provides a multi-year record of beaked whale acoustic activity at two sites along the shelf break off North Carolina: Cape Hatteras (HAT) and Onslow Bay (OB). The two sites were located approximately 200 km apart along the same depth contour. We collected 10 Hz – 100 kHz bandwidth recordings at each site using an autonomous High-frequency Acoustic Recording Package deployed at approximately 900 m. Data were collected from 2011 to 2014, resulting in 524 and 436 recording days at HAT and OB, respectively. We analyzed recordings for echolocation signals with spectral and temporal characteristics that matched known beaked whale signal types. We detected signals produced by Cuvier's (*Ziphius cavirostris*), Gervais' (*Mesoplodon europaeus*), and Blainville's (*M. densirostris*) beaked whales at each site, and found significant differences in the occurrence of signal types between sites. Detections at HAT were predominantly of Cuvier's beaked whales (present on >95% of days), while detections at OB were predominantly of Gervais' beaked whales (present on 97% of days). Blainville's beaked whales were detected infrequently (5% of days or less) at both sites. No distinct temporal patterns were apparent for the predominant species at each site, indicating that they utilize the two sites in a consistent manner across days, months, and seasons. Our data collection at HAT is ongoing and future analyses will include additional monitoring sites, allowing for broader geographic comparisons in the western North Atlantic.

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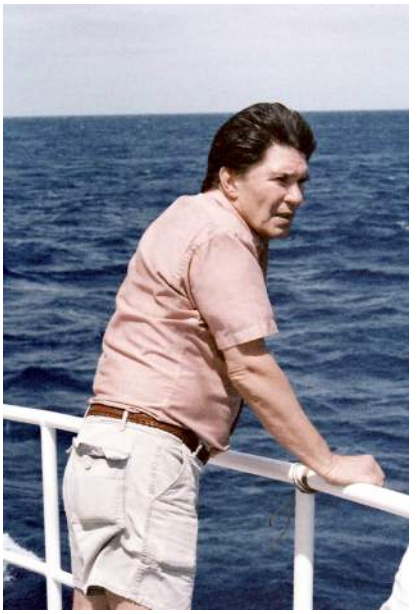

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