

Differences in beaked whale species occurrence on an active sonar weapons range

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Cuvier's beaked whale (*Ziphius cavirostris*) is the species predominantly associated with unusual mortality events which have occurred coincident with certain naval exercises. We show here an apparent lack of Cuvier's and Gervais' (*Mesoplodon europaeus*) beaked whales on the active sonar weapons range at the US Navy's Atlantic Undersea Test and Evaluation Center (AUTECH) in the Bahamas, while Blainville's beaked whales regularly occurred. AUTECH is located in the Tongue of the Ocean (TOTO) in the northern Bahamas, and is a U-shaped trough reaching depths of 2 kilometres. AUTECH's Weapons Range is equipped with 91 bottom-mounted hydrophones spaced ~4 kilometres apart, covering ~1,500 km² of water and is used for fleet readiness tests and training which include the use of mid-frequency active sonars. Nine separate field efforts were conducted on the AUTECH Weapons Range between April 2005 and May 2009 to document species occurrence, focusing on beaked whales. The Marine Mammal Monitoring on Navy Ranges (M3R) system was used to monitor the AUTECH hydrophones, and observer vessels were directed to vocalizing animals based on M3R passive acoustic detections and localizations. For these field efforts, there were 79 days when the weather was calm enough to operate small boats, resulting in 721 hours of on-water effort. Twelve species of marine mammals were encountered, predominantly consisting of deep-diving, teuthophagus odontocetes. While Blainville's beaked whale (*Mesoplodon densirostris*) was commonly found (74 sightings), Cuvier's beaked whale was rarely seen (3 sightings), and Gervais' beaked whale was never seen. The 3 Cuvier's sightings occurred at the southern extreme of the Weapons Range, and Gervais were found in TOTO, but south of the weapons range. It is unclear whether the difference in ziphiid spatial distribution in TOTO is prey related, due to the active acoustics associated with the Weapons Range, or other environmental factors.