

Using passive acoustics to monitor the presence of marine mammals during naval exercises

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Passive acoustic data were collected from Marine Autonomous Recording Units during fall (13 September to 8 October) and winter (3 December to 8 January) 2009-2010. These data were analyzed for acoustic detections of marine mammals and navy sonar. Patterns of vocalizations, including seasonal and diel trends and effects of sonar activities were characterized. The study site coincided with the United States (U.S.) Navy's planned Undersea Warfare Training Range (USWTR) located approximately 60-150 kilometers off Jacksonville, Florida. The probability of vocalization events were calculated for each species relative to sonar events. Results indicated that minke whales were present almost continuously during the winter deployment period. Right whale vocalization events were most concentrated during winter, as expected, but also were detected at deep sites (>500m), which was somewhat unexpected. Sperm whale vocalization events occurred exclusively near the continental shelf break, and showed a strong diel pattern with almost all vocalization events occurring between dusk and dawn. There were less obvious patterns for delphinid vocalization events, possibly because we were not able to identify detections to species, and thus multiple species were grouped into one generic category. Blackfish were detected relatively infrequently but were most common at the shallow-water sites. Minke whales vocalization events had a strong negative relationship with sonar events when data from all sites were combined. These results provide an assessment of marine mammal occurrence and distribution within the U.S. Navy's planned USWTR and important insights on species specific vocal responses, or lack of, to sonar events.



Program

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