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Marine Mammal Monitoring during Navy Explosives Training Events off the Coast of Virginia Beach, Virginia

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Navy training events involving the use of explosives pose a potential impact to marine mammals. This study used passive acoustic and visual monitoring data to evaluate marine mammals' behavioral responses to noise from explosive events. Monitoring was conducted during five training events in the Virginia Capes (VACAPES) Range Complex during August - October of 2009-2013. Passive acoustic monitoring methods ranged from a single hydrophone to an array of sonobuoys monitored in real time. Visual monitoring effort over the five events totaled approximately 41 hours (day before events: 11.3 hours; days of events: 21.1 hours; day after events: 8.7 hours), yielding a total of 45 marine mammal sightings. Approximately 124 hours of acoustic data were collected before, during, and after the 5 events. Potential behavioral changes were evaluated based on analysis of vocalizations detected before, during, and after explosions and concurrent data from visual sightings. For time periods with both visual and acoustic monitoring data, detection methods were compared to evaluate effectiveness. Continuing use and evaluation of both visual and passive acoustic methods for monitoring of explosive training events will improve our knowledge of potential impacts resulting from explosive events and help improve management and conservation of marine mammals.