Information on baleen whales derived from localized calling individuals at the Pacific Missile Range Facility, Hawaii

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Passive acoustic monitoring automated processes for detection, classification, model-based localization and tracking have been utilized for multiple species of baleen whales using recorded data from 47 off-shore, bottom-mounted broadband hydrophones at the Pacific Missile Range Facility, Kauai, Hawaii. Automatically detected baleen whales calls' start times are compared with model-based localizations start times for determining locations where calls were emitted. Kinematic tracks are generated from localizations when multiple parameters exceed thresholds. The kinematic tracks support the notion of a single individual being tracked when call types, intervals, swim speeds and behaviors match what is known for a species. Localization and tracking capabilities increase knowledge of the species monitored by providing: density estimates based upon counts of animals which call, which are more informative than density of calls, directly measured cue rates of animals which call, species utilization of the various habitats being monitored, and different behavioral states of animals can be inferred. Information derived from kinematic tracks such as swim speeds and animal headings lead to basic behavioral observations such as 'traveling' (animals moving through the area at fairly constant headings and speeds) and 'milling' (where animals remain in the area for long periods of time with many heading and speed changes).

Examples are provided for rarely sighted, but acoustically localized and tracked, minke (Balaenoptera acutorostrata) and Bryde's (Balaenoptera brydei) whales. Behavioral responses of localized minke whales to Navy training have shown lower densities of calling animals in the area during Navy training compared to other periods of time.

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