

Best Video Talk: Charlotte Dunn

Title:

Bahamian sperm whales: Smaller than average

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Abstract:

The size of a whale can help determine its age-class, sex, and fitness. We compared size estimates of individual sperm whales (*Physeter macrocephalus*) in the Bahamas using two unique methods: photogrammetric measurements using a small unmanned hexacopter (NOAA APH-22), and acoustic measurements using recordings of individual clicks. We flew the hexacopter directly over whales to collect high resolution vertical images. When the whales dove, digital images of their flukes were taken to allow for individual identification. Acoustic recordings were made when individuals fluked asynchronously, to allow ‘first clicks’ to be assigned to the correct individual. Recordings were made using a GeoSpectrum handheld hydrophone, and recorded on a Tascam digital recorder sampling at 96kHz. For acoustic measurements, the interpulse intervals of the individuals’ clicks were used as an index of body size, resulting in total length (TL) estimates for 24 whales that ranged from 7.82m to 13.31m. For aerial measurements, pixels from images were scaled to real size using data on altitude and lens focal length, resulting in TL estimates for seven whales that ranged from 4.71m to 8.71m. Bias in the altitude estimates from the hexacopter was evaluated using measurements from 35 images of a boat of known size; average error was <1% (i.e. <4cm). Three of the seven individuals (all adult females) measured using the hexacopter were acoustically recorded in parallel to allow for a comparison between the two methods. The difference in TL estimates using both methods was <0.5m, demonstrating that the method of acoustic size estimation for sperm whales in this population is reliable. Notably, these measurements show that adult female sperm whales are small compared to other populations, possibly an adaptive consequence of living in a sub-tropical oligotrophic environment.

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