

# International workshop. Cetacean echolocation and outer space neutrinos: ethology and physics for an interdisciplinary approach to underwater bioacoustics and astrophysical particles detection



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## Cetacean density estimation from passive acoustic data

*Monday, 21 October 2013 16:30 (50 minutes)*

The estimation of density (and abundance) of cetaceans is a key step towards their management and conservation. Currently, the most widely used methods for obtaining density estimates are distance sampling or capture-recapture methods, usually involving visual detections and/or marking (even if only conceptual, e.g. photo ID). However, many cetacean species are difficult to sight, and cannot be easily marked or recaptured. Some of these species produce readily identifiable sounds, opening the door to use passive acoustic data to estimate animal density. Automated acoustic data collection means that surveys can occur at times and in places where it would be too expensive or dangerous for human observers. While the methods are also applicable to other aquatic and terrestrial sound-producing taxa, most applications to date have involved cetaceans and sensors at fixed locations. We present an overview of cetacean density estimation using passive acoustic data, reviewing the types of data and methodological approaches currently available to researchers, noting primary methods are based on distance sampling and spatially explicit capture-recapture concepts. We provide a framework for acoustics-based density estimation, illustrated with examples from real-world case studies. We also mention a number of possible research areas that might help the field of passive acoustic density estimation to develop further.

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