

Free-ranging marine mammals, the next ‘Ships of Opportunity’?

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The deployment of two-way coded (transmitting and receiving) acoustic transceivers on marine mammals (“bioprobes”) has the potential to provide individual level information about inter- and intra- species interactions from inaccessible marine environments. However, transceivers differ in their detection efficiency due to the time the bioprobe animal spent in sub-optimal environmental conditions for transmitting and receiving data (e.g., complex geomorphology, variation in water properties), as well as influences from the bioprobes’ behaviour. These differences in detection efficiency have important implications for drawing biological inferences due to the uncertainty surrounding the number of tagged animals detected. Therefore, to effectively use these data, one must quantify the uncertainty associated with a bioprobe detecting a tagged animal in a given area.

We quantified the detection efficiency of Vemco Mobile Transceivers (VMT) deployed on 38 grey seals (*Halichoerus grypus*) on Sable Island, Canada in 2010 and 2011 in relation to environmental characteristics and aspects of the seals’ behavior using generalized linear modeling techniques and Receiver Operator Characteristic curves. We observed the greatest decreases in detection efficiency in areas of high wind stress and as distance increased between seals. We related these findings to metrics of the bioprobe’s sampling coverage, exploring the individual’s residence time and travel speed across the study area and over time. Using this information, we make recommendations for future surveys of this kind.