Proceedings of the Annual General Donald R. Keith Memorial Conference
West Point, New York, USA
May 4, 2017
A Regional Conference of the Society for Industrial and Systems Engineering

Design of an Improved Model for Marine Species Movement

Andrew Fernandez, Raul Ayllon, Jay Daniel Gusman, and Christopher Ludwig

George Mason University

Corresponding author's Email: aferna16@gmu.edu

Author Note: This project was sponsored by JASCO Applied Sciences.

Abstract: High intensity offshore acoustic events, such as geological surveys, have the potential to harm marine species in the area. Consequently, the National Oceanic and Atmospheric Administration (NOAA) requires any organization that performs offshore acoustic activities to apply for an incidental take authorization. The organization must provide an estimate for the number of animals that could be affected by the acoustic event. The currently accepted approach to calculating these estimates is to model the movement and potential exposure of species in the area during the acoustic event. Current models do not sufficiently account for behavioral responses. This study attempted to find the optimal approach to simulate the behavior of various marine species based on available modeling techniques. The overall objective was to minimize the uncertainty in the incidental take estimates. After testing various models in a previously studied scenario, current results suggest that adding realism may increase or decrease uncertainty, situationally.

Keywords: Modeling, Simulation, Marine, Species, Acoustic, Impact