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"What was that Sound?"

Abstract: Mr. Bruce Martin, JASCO Applied Sciences

Acoustic and Animat Modeling for Predicting the Potential Impacts of Underwater Sound from Offshore Exploration on Marine Life

Results from over a decade of focussed research into the effects of sound on marine life are sufficient for governments to review and improve regulations for sound produced by anthropogenic activities. Many jurisdictions now mandate that project proponents predict the effects of their planned activities. Canada and the United States use significantly different approaches for mitigating the effects of seismic surveys on marine life. In Canada if a marine mammal is detected visually or acoustically within a fixed distance of 500 m of the airgun array the array must be shutdown. The 500 m safety zone can be increased by the regulatory boards or the department of fisheries and oceans (DFO) if the survey is likely to affect species at risk or their critical habitats. The United States requires project proponents to model the sound levels from the airgun array. The exclusion zone is defined as the radius at which sound levels fall below thresholds associated with harm to the hearing of marine mammals (or endangered species of fish). In this talk JASCO models a hypothetical seismic survey over a 24 hour period as it crosses from deep water, across the Scotian Shelf of Nova Scotia, and onto Banqereau Bank. At several waypoints along the track we compare the exclusion zones based on the default 500 m zone, the High Energy Seismic Source criteria (NOAA 2000), the criteria recommended by Southall et al (2007), and the criteria contained in the NOAA 2013 Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals. Finally we apply animat models to predict the number of endangered blue whales, right whales and northern bottlenose whales along the track that would be exposed to sounds levels that exceed the SEL thresholds contained in the NOAA 2013. The animat modeling provides a method of performing risk analysis for assessing the possible impact of a proposed activity.