

Current Efforts to Mitigate Ship Strikes Using Real-Time Acoustic Monitoring of Right Whales from Autonomous Platforms

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The location of most of the right whale population is unknown most of the time, and this is a fundamental factor limiting effective ship strike mitigation. To help address this issue, a system was developed to continuously monitor right whales in near real-time from autonomous ocean platforms. The system (DMON-LFDCS) consists of a hydrophone that records low frequency audio and software that detects and classifies right whale sounds from the recorded audio. A subset of ~ 25% of this data is transmitted to a shore station via Iridium satellite, where it is validated by a trained analyst and then disseminated to stakeholders. Since 2014, the DMON-LFDCS has been deployed on Slocum gliders and buoys to monitor right whale presence from the New York Bight to the Gulf of St. Lawrence, which encompasses the core right whale feeding range. Right whales have been detected in near real-time by these platforms over 700 times. Validation of the real-time protocol demonstrates that it correctly detects true right whale acoustic presence with nearly 100% accuracy. Missed detection rates, which are moderate, can be reduced by increasing the subset of data sent via Iridium satellite. We summarize current applications of the technology in Canadian waters, including monitoring during the Gulf of St. Lawrence mortality event, in high-use shipping routes and a seasonal Area to be Avoided. We conclude with a vision for the future of the widespread implementation of this system to conduct real-time monitoring and mitigation of ship strikes in the Northwest Atlantic.