

NOISESPOTTER: NEW TECHNOLOGY FOR UNDERWATER ACOUSTIC CHARACTERIZATION

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NoiseSpotter is a cost-effective environmental monitoring system that characterizes, classifies, and provides accurate location information for anthropogenic and natural sounds. It has been developed with the primary goal of supporting the evaluation of potential environmental effects of offshore energy projects. NoiseSpotter consists of a compact array of three acoustic vector sensors that measures acoustic pressure and three-dimensional particle velocities associated with the propagation of an acoustic wave, thereby inherently providing bearing information to an underwater source of sound. The NoiseSpotter utilizes an array of three vector sensors to triangulate individual bearings and provide sound source localization. This allows for a characterization of the acoustic signature of specific acoustic sources located in different regions of the ocean. Location estimation errors of less than 5% of actual were accomplished during in-water field tests with the NoiseSpotter separated from controlled, acoustic source transmissions at varying distances, demonstrating its potential for acoustic characterization of offshore energy devices. Continued NoiseSpotter development will result in onboard data processing and real-time transmission of data digests for web-based data presentation. Data digests will include acoustic metrics for noises of interest such as source location, peak sound levels, and signal-to-noise levels, along with ambient noise levels. The end-result will be a rapidly deployable, real-time, autonomous underwater acoustic characterization system to support environmental monitoring of marine hydrokinetic energy projects.

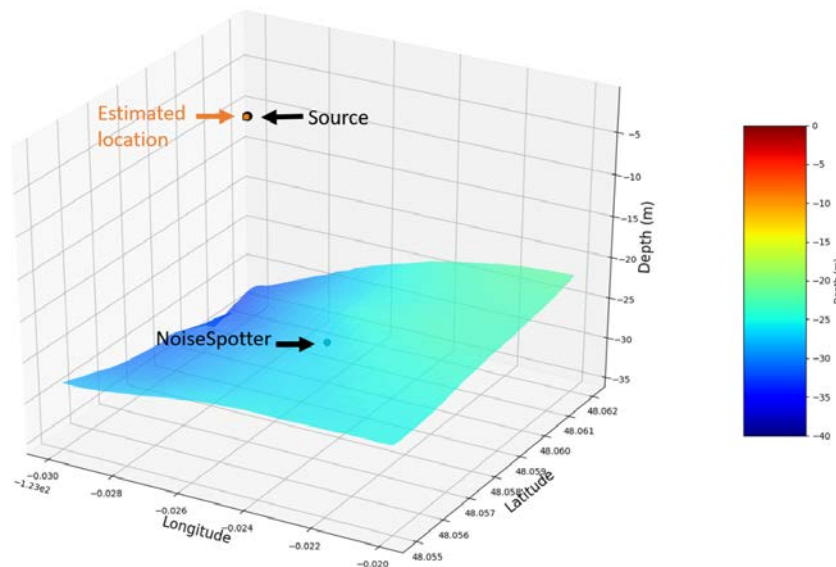


FIGURE 1. NOISESPOTTER ACOUSTIC LOCATION ESTIMATION RESULTS. TRUE (BLACK) AND ESTIMATED (ORANGE) LOCATIONS RELATIVE TO THE NOISESPOTTER (BLUE). THE DIFFERENCE BETWEEN TRUE AND ESTIMATED LOCATIONS IS 3.6 M (<2% OF SEPARATION DISTANCE OF 200 M).

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