Underwater noise of commercial vessels in Nusakambangan Strait and the relationship with distance

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Abstract	The existence of shipping activities can produce noise with certain characteristics as a main source of noise pollution in the waters. This research aimed to study the sound characteristics (frequency and sound pressure levels) of various type of commercial vessels crossing the Nusakambangan Strait, its relationship to the distance, and their potential impact to the marine biota. Noise frequency and sound pressure level were determined by spectral and envelope analysis from sound recording by hydrophone, while the type of vessel that produces noise and the distance from receiver were analyzed based on video recording. Relationship between frequency and sound pressure level to the distance were analyzed using simple linear regression. Results showed that frequency of noise is varied more clearly compared to the sound pressure level (1,7 ÃƒÂ¢Ã¢Â‚Â¬Ã¢€Âœ 20 kHz and 93.8 -117.8 dB re 1 ÃƒÂŽÃ‚Â¼Pa respectively) for each type of vessel (ro-ro ferry, small fishing boat, small ferry, tug boat and pilot boat) based on the size of the ship, engines type and power, loading capacity and vessels speed. Sound characteristics changed based on distance, where the frequency of sound increases (0.04 ÃƒÂ¢Ã¢Â‚Â¬Ã¢€Âœ 34.28 Hz.m-1) and different things for sound pressure level (0.04 ÃƒÂ¢Ã¢Â‚Â¬Ã¢€Âœ 0.11 dB dB re 1 ÃƒÂŽÃ‚Â¼Pa m-1). Estimated source level also differ from one ship to another (105 ÃƒÂ¢Ã¢Â‚Â¬Ã¢€Âœ 128 dB dB re 1 ÃƒÂŽÃ‚Â¼Pa). The existence of ship noise has the potential impacts on the presence of marine biota in these waters.
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