

Macro- and micro-scale spatial variation in the acoustic activity of snapping shrimp on coral reefs in the Pacific

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Coral reef soundscapes are increasingly becoming recognized as critical factors in the study of reef dynamics, from the role they play in larval recruitment to the assessment of coral reef biodiversity and ecosystem stability. Snapping shrimp produce the predominant source of sound on most coral reefs at frequencies between 2 and 20 kHz. Their activity is influenced by a variety of abiotic factors. As such, coral reef soundscapes are prone to considerable flux and variation. However, this variation is still poorly understood on a variety of spatial and temporal scales, making it difficult to draw meaningful comparisons between the soundscapes of different reefs. We report on an effort to quantify the acoustic activity of snapping shrimp across 12 coral reef sites in the Pacific Ocean separated by distances ranging from hundreds of meters to thousands of kilometers, including reefs across the Hawaiian archipelago, the Northern Mariana Islands, and American Samoa. We use data obtained from long-term, bottom-moored acoustic recorders to document the variability in snapping shrimp activity observed on multiple temporal scales and examine factors correlated with this variability at each location.

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