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Passive acoustic mapping of marine biological choruses

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Since underwater sound is a critical aspect of the ocean environment for marine animals, passive acoustic recordings provide important information on marine habitats. Conversely, because biological sounds can be a dominant component of the ocean sound field, knowledge of their characteristics is important for assessing sonar system performance. This presentation summarizes the properties of three biological choruses observed in experiments off the southern California coast. Measurements were made with large aperture, well-filled hydrophone arrays, yielding highly resolved estimates of the chorus directionality. The first chorus generated energy in the 200-800 Hz band, occurred predominantly at night in spring and summer, and displayed an unusual spatiotemporal pattern where the region of chorusing periodically propagated upcoast over 25 km of coastline at nearly 1.5 km/sec. The other two choruses occurred in the 1-10 kHz frequency band and come from slowly-moving, or fixed, sources at, or near, the ocean bottom. One chorus was present only on two consecutive nights during a summer experiment, whereas the second occurred at all times throughout the 10-day duration of a late winter experiment. Numerical models predict some of the characteristics of the choruses. [Work supported by the Office of Naval Research].