effects of seismic sound covariates were found on sighting distance from shore. However, higher sound levels in the previous 24 to 48 hours were significantly associated with decreased grid cell densities. Results of this study will help inform future seismic survey mitigation planning for this population and other baleen whales.

Electrophysiology and ecology of automatic gain control in bottlenose dolphin (*Tursiops truncatus*) echolocation

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Studies of toothed whale echolocation have demonstrated an automatic gain control (AGC) mechanism that serves to maintain a constant perceived echo level for a target, independent of the changes in echo strength that naturally result from acoustic spreading loss. This study aimed to determine the target ranges at which this AGC process can operate. A bottlenose dolphin was trained to perform an echoic discrimination task. A phantom echo generator produced echoes with delays corresponding to target ranges larger than those previously examined—up to 80 m. Auditory evoked potentials (AEPs) related to the dolphin's outgoing click and the incoming echo were simultaneously recorded during the discrimination task. Under simulated natural spreading loss conditions, the dolphin's emitted click level increased with increasing target range in a manner similar to that observed in other studies with this species. Echo-related AEP amplitudes were essentially constant up to 14 m and progressively declined at longer ranges. This pattern resulted, at least in part, from forward masking of target-related echoes by the dolphin's outgoing click. Further testing demonstrated that forward masking continued to operate on time scales up to at least 70 ms; however, the decline in echo-related AEP amplitudes past 14 m indicated that this form of receiver-based AGC did not fully compensate for spreading loss at longer ranges. The dolphin AGC system is similar to that of echolocating bats; however, the relative increase in sound speed and the reduced absorption of high frequencies underwater potentially result in a greater range over which the perceived echo is independent of distance-dependent transmission loss. Therefore, while dolphin AGC appears unable to maintain constant echo-related AEP amplitude at longer ranges, the relationship between the AGC system and the physics of underwater sound may still allow for the accurate perception of targets at distances of tens of meters.

Indo-Pacific Humpback dolphin (*Sousa chinensis*) acoustic monitoring near a construction area off West Lantau Island, Hong Kong

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The Indo-Pacific humpback dolphin (*Sousa chinensis*) is classified by the IUCN Red List as 'near threatened' throughout its range, which comprises numerous small, fragmented, coastal subpopulations. One of the largest subpopulations occurs in the Pearl River Estuary in southern China, adjacent to Macau and Hong Kong, in an area that is heavily impacted by vessel traffic, fishing, and development. As part of an environmental assessment pertaining to construction of a new bridge between Hong Kong and mainland China, visual and acoustic monitoring techniques were employed to evaluate*S. chinensis* habitat use near West Lantau Island before and during construction. Continuous passive acoustic monitoring by moored underwater recorders was initiated at two locations approximately 12 km apart, one near a bored piling site and one in a 'control' site at a known area of dolphin use, Fan Lau. Pre-construction recordings indicated different daily patterns in the number of dolphin signals detected, with a single nighttime peak at the bridge construction site and bimodal peaks in the morning and evening at Fan Lau, suggesting differential habitat use at the two sites. On a weekly scale, detection rates at both sites were relatively high in early February, followed by a gradual decrease and lull in mid-February coincident with the new moon, and a subsequent increase again over the next 1-2 weeks; this pattern suggests lunar and/or tidal periodicity of dolphin habitat use in this area. Data from vessel-based visual and acoustic surveys were collected to quantify acoustic activity in relation to covariates such as group size, behavior, occurrence of nearby vessels, sea state, and background noise levels. Results of these studies will be integrated to document baseline occurrence and acoustic behavior patterns and assess any shifts in dolphin distribution or activity as a potential response to construction-related disturbance.

Sensitivity of the Vibrissae of a Harbor Seal (*Phoca vitulina*) to Directly Coupled Sinusoidal Vibrations

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The vibrotactile sense of seals relies on sturdy, specialized vibrissae and supporting neural architecture apparently designed for the reception of water-borne vibrations. In this study, we measured the sensitivity of a trained harbor seal (*Phoca vitulina*) to sinusoidal stimuli delivered by a vibrating plate that directly contacted the vibrissae. The seal was tested in a go/no-go behavioral paradigm in order to determine the smallest velocity that was detectable at each of nine test frequencies from 10 Hz to 1000 Hz. The stimulus plate was driven by a vibration shaker and the velocity of the plate at each frequency-amplitude combination was calibrated with a laser vibrometer. The seal wore a blindfold and headphones playing broadband masking noise during testing to prevent cueing from other sensory stimuli. His performance in this stimulus detection task showed that the vibrissal array was sensitive to directly-coupled vibrations across the range of frequencies tested, with best sensitivity of .09 mm/s at 80 Hz. Velocity thresholds as a function of frequency showed a characteristic U-shaped curve for this subject with decreasing sensitivity below 20 Hz and above 250 Hz. For comparative purposes, we also tested human subjects with the same experimental paradigm using their thumb to contact the vibrating plate. Threshold measurements for the human thumb were similar to those of the seal vibrissae, demonstrating good tactile sensitivity for these structurally different mechanoreceptive systems. Only two prior studies have investigated vibrotactile perception in behaviorally active seals. The thresholds measured for a harbor seal in the present study were about 100 times more sensitive than previous in-air measures of vibrissal sensitivity in this species. The results were similar to those reported by others for detection of waterborne vibrations, but show an extended frequency range of sensitivity.

Ranking the risk of cetacean watching sites in Southeast Asia to local cetacean populations

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