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Passive acoustic localization techniques of Eastern Pacific grey whales

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Eastern Pacific grey whales (Eschrichtius robustus) apparently do not actively echolocate, yet still they thrive in shallow water environments where visibility is much reduced. Along their migration route and in their feeding grounds these whales are exposed to high levels of ambient noise, highly turbid waters and many underwater obstacles. To test possible passive acoustic localization mechanisms (e.g. Acoustic Daylight Imaging and Passive Synthetic Aperture), we made extensive acoustic measurements during comprehensive field studies of these whales on their summer feeding grounds in British Columbia (Canada). In combination with visual observations of the whales and their behaviours, we investigated the acoustical sources available to the whales when navigating within a feeding bay. First, we measured ambient noise levels to construct the acoustic landscape around the whales. Second, we investigated how sound is altered when objects such as kelp beds and rocks are present. We also measured acoustic changes induced by direct, controlled modifications of the near-shore environment. The aim of this research is to understand how grey whales might be finding their way around, and what impact, if any, increased levels of ambient noise might have on the whales' ability to find food and navigate within the feeding grounds.

Keywords: ambient noise, grey whales, passive acoustics
Technical area: Animal Bioacoustics (AB) - ECUA
PACS #1: 43.30.Nb Noise in water; generation mechanisms and characteristics of the field (see also 43.50.Nm and 43.28.Ra)
PACS #2: 43.30.Sf Acoustical detection of marine life; passive and active
PACS #3: 43.50.Rq Environmental noise, measurement, analysis, statistical characteristics