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### **Complex masking scenarios in Arctic environments**

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Critical ratios obtained using octave-band noise and narrowband signals provide a useful first approximation for understanding the effects of noise on hearing. When considering realistic listening scenarios, it may be necessary to examine the effects of spectrally complex, time-varying noise sources on an animal's ability to detect relevant signals. In the case of Arctic seals, the increasing prevalence of seismic exploration makes an examination of masking by impulsive sounds particularly relevant. However, the characteristics of received sounds from airgun operations vary dramatically depending on the seismic source, environmental parameters, and distance. In order to determine the potential for auditory masking by airguns, we developed a paradigm to quantify the influence of spectral and temporal variations in typical seismic noise on signal detectability. This method calls for calculation of detection probabilities for seals listening for the same signal embedded at different time windows within a background of distant airgun noise. We believe this approach will enable an experimental assessment of masking potential by impulsive noise as distance between the receiver and source is increased. Such an assessment will aid in determining the extent to which standard critical ratio data can be reasonably applied in complex masking scenarios. [Work supported by OGP-JIP].