



Acoustical Society of America

The Journal of the Acoustical Society of America

F

Predicting masking by impulsive noise sources: An experimental evaluation

Jillian M. Sills¹, Brandon L. Southall² and Colleen Reichmuth³

[+ VIEW AFFILIATIONS](#)

J. Acoust. Soc. Am. **140**, 3022 (2016); <http://dx.doi.org/10.1121/1.4969374>

Impulsive noise sources pose significant challenges in terms of predicting auditory masking using conventional methods. Aside from their obvious time-varying structure, another complicating factor is the influence of propagation on the spectral and temporal characteristics of the noise, especially in water where such sounds may travel considerable distances. To address this, we developed a psychophysical paradigm to quantify masking in Arctic seals during different time intervals of seismic maskers, which were recorded either close to (1 km) or far from (30 km) an operational air gun array. Signal-to-noise ratios at threshold (50% correct detection rate) were obtained behaviorally for trained seals, and were compared to conventional masked threshold predictions based on average noise levels and critical ratio measurements for the same individuals. The experimental data showed that masking predictions were poorest in the time intervals where noise exhibited the greatest amplitude variation. These findings provide insight into whether and how the dynamic sound field surrounding seismic surveys constrains the ability of seals to detect relevant signals, and show how predictive models of masking for transient noise sources can be improved by incorporating time-based analyses of signals and noise. [Work supported by OGP-JIP.]

© 2016 Acoustical Society of America