

Table S1. Chi-square statistics for smoothed predictors, with associated p-values ($\alpha \leq 0.05$), for the top blue whale model. ‘Estimated degrees of freedom’ (edf) is a summary statistic of GAMM that reflects the degree of non-linearity of a curve (i.e., an edf = 1 is equivalent to a linear relationship, while an edf > 2 implies a highly non-linear relationship). The level of significance is denoted by asterisks.

Smooth terms	edf	Chi-square	p-value
s(Depth)	4.000	303.90	< 0.001***
s(Noise Level)	1.480	73.73	< 0.001***
s(Distance)	2.799	5.23	0.152

R²-adjusted = 0.41; deviance explained = 42%; n = 2648.

Table S2. Model estimates (\pm standard error) and z values for factor predictors and Chi-square statistics for smoothed predictors, with associated p-values ($\alpha \leq 0.05$), for the top fin whale model. Parametric coefficients of Light Regime are relative to detections during the day. ‘Estimated degrees of freedom’ (edf) is a summary statistic of GAMM that reflects the degree of non-linearity of a curve (i.e., an edf = 1 is equivalent to a linear relationship, while an edf > 2 implies a highly non-linear relationship). The level of significance is denoted by asterisks.

Parametric coefficients	Estimate (\pm SE)	z value	p-value
Light Regime (Dawn)	-0.208 (0.251)	-0.831	0.406
Light Regime (Dusk)	0.053 (0.277)	0.190	0.849
Light Regime (Night)	-0.061 (0.199)	-0.306	0.760

Smooth terms	edf	Chi-square	p-value
s(Depth)	3.999	195.741	< 0.001***
s(Noise Level)	2.814	54.390	< 0.001***
s(Distance) : Light Regime (Dawn)	2.161	4.765	0.113
s(Distance) : Light Regime (Day)	2.609	6.567	0.088
s(Distance) : Light Regime (Dusk)	2.150	12.224	< 0.007**
s(Distance) : Light Regime (Night)	3.737	20.407	< 0.001***

R²-adjusted = 0.47; deviance explained = 43.6%; n = 2648.

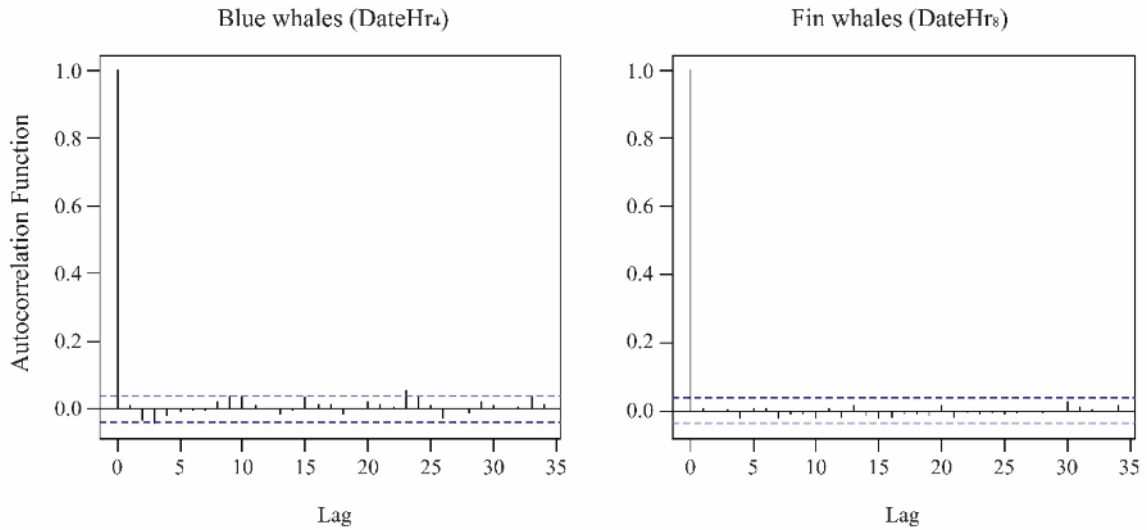


Figure S1. Plots showing the outputs of the autocorrelation functions (ACF) run on the residuals of the most parsimonious blue and fin whale models. Negligible autocorrelation (i.e., lag ACF values between the blue dashed significance lines) was achieved by using the date and time at the start of each 15-minute presence/absence bin, grouped into four- and eight-hour bins beginning at midnight, as a random effect in the blue and fin whale models, respectively. In other words, 15-minute acoustic presence/absence bins were highly correlated (i.e., non-independent) within but not across each successive four-hour date-time bin.

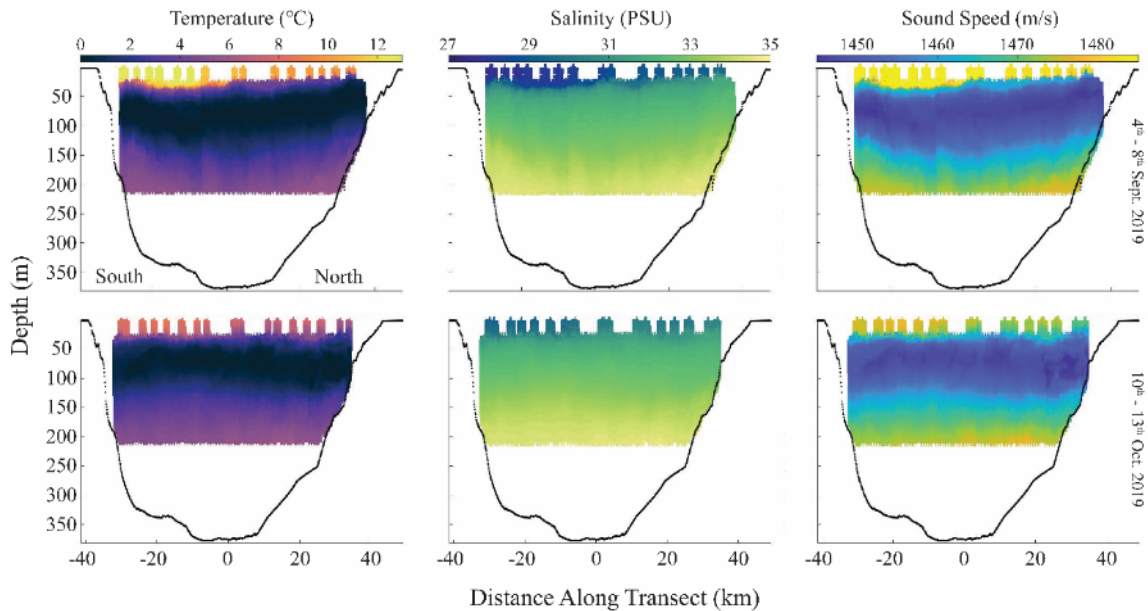


Figure S2. Temperature, salinity from CTD measurements, and estimated sound speed profile in the Honguedo Strait from the Gaspé Peninsula to Anticosti Island during two glider transits in early September (top) and early October (bottom); adapted from Gehrman et al. 2023