Shaken, not stirred: blue whales show no acoustic response to earthquake events

Dawn R. Barlow[1]*, Mateo Estrada Jorge[1,2], Holger Klinck[3,4], Leigh G. Torres[1]

[1]Geospatial Ecology of Marine Megafauna Lab, Marine Mammal Institute, and Department of Fisheries, Wildlife, and Conservation Sciences, Oregon State University, Newport, Oregon, USA
[2]Department of Computer Science and Department of Physics, Oregon State University, Corvallis, Oregon, USA
[3]K. Lisa Yang Center for Conservation Bioacoustics, Cornell University, Ithaca, New York, USA
[4]Marine Mammal Institute, Department of Fisheries, Wildlife, and Conservation Sciences, Oregon State University, Newport, Oregon, USA

*dawn.barlow@oregonstate.edu

SUPPLEMENTAL MATERIAL

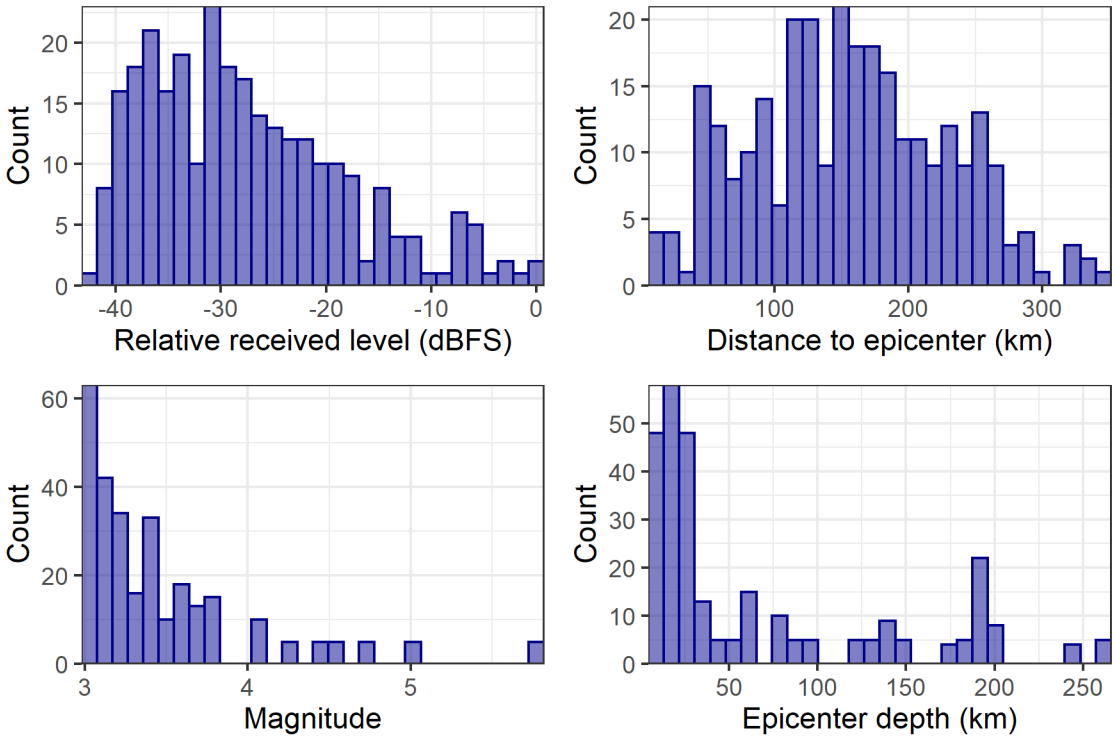

Figure S1. Histograms illustrating the distribution of earthquake strength and proximity metrics contained in the dataset.

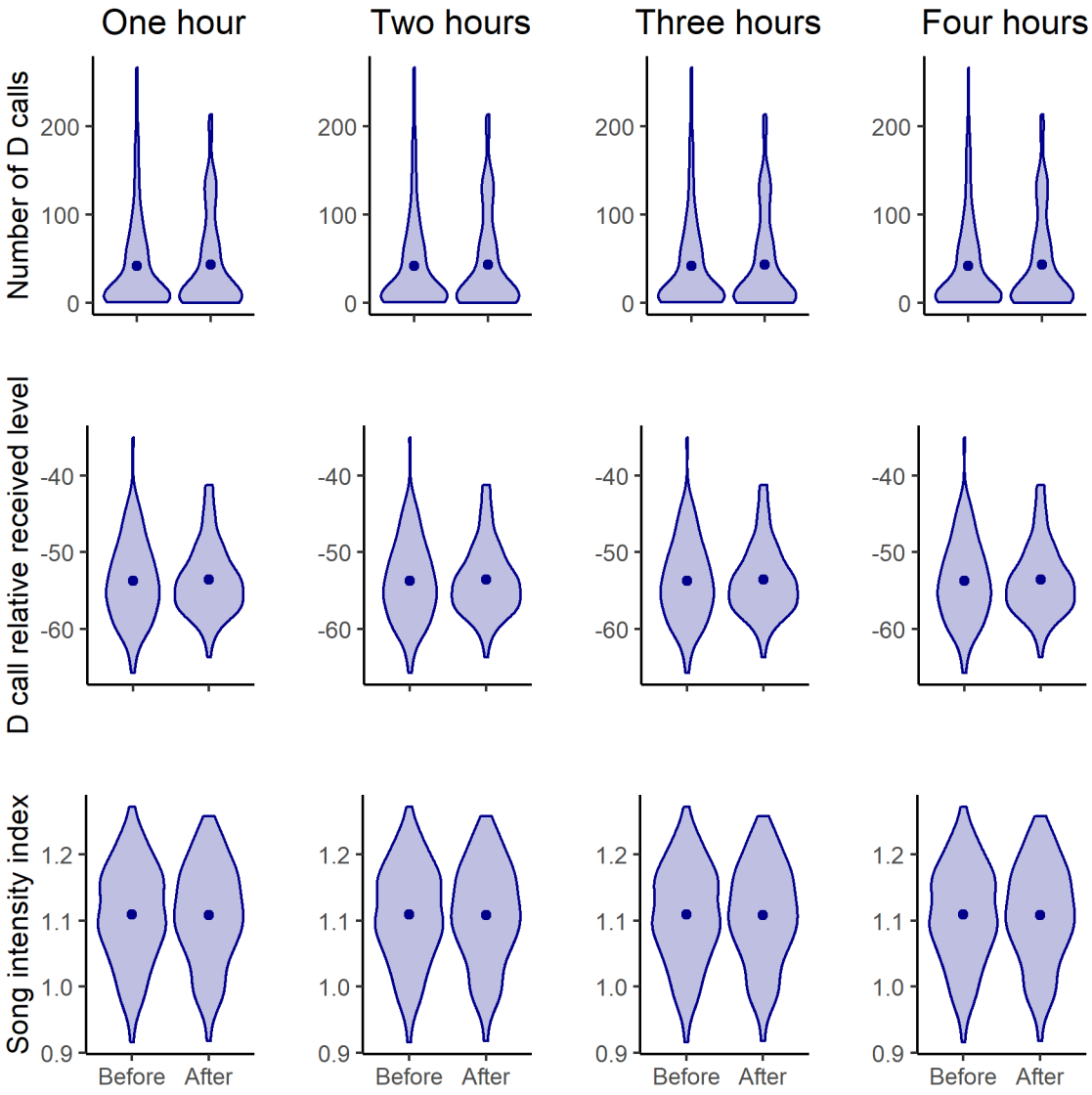

Figure S2. Violin plots comparing calling activity before and after earthquake events at each of the four temporal windows examined.

Table S1. Results of the linear models examining whether earthquake-related metrics demonstrate significant relationships with change in blue whale calling, measured using several different call parameters as response variables. Models were run with each of the three call metrics examined as the response variable, for each of the four temporal windows examined. Bold indicates statistically significant relationships.

	Response variable	**Predictor variables**	**F-statistic**	**R-squared**	**p-value**
1 hour	Δ number of D calls (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **number of D calls before*** + day of year + factor(hydrophone unit)	2.759	0.156	**0.004***
	Δ D call relative RL (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + number of D calls before + day of year + factor(hydrophone unit)	1.940	0.101	0.053
	Δ song intensity (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + song intensity before + day of year + factor(hydrophone unit)	1.163	0.012	0.322
2 hours	Δ number of D calls (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **number of D calls before*** + day of year + factor(hydrophone unit)	5.108	0.277	**5.377×10^{-6}***
	Δ D call relative RL (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + number of D calls before + day of year + factor(hydrophone unit)	1.673	0.065	0.099
	Δ song intensity (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **song intensity before*** + day of year + factor(hydrophone unit)	2.116	0.080	**0.028***
3 hours	Δ number of D calls (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **number of D calls before*** + day of year + factor(hydrophone unit)	6.099	0.309	**2.966×10^{-7}***
	Δ D call relative RL (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + number of D calls before + day of year + factor(hydrophone unit)	1.594	0.052	0.119
	Δ song intensity (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **song intensity before*** + day of year + factor(hydrophone unit)	1.977	0.070	**0.041***
4 hours	Δ number of D calls (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **number of D calls before*** + day of year + factor(hydrophone unit)	3.178	0.155	**0.001***
	Δ D call relative RL (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + number of D calls before + day of year + factor(hydrophone unit)	1.441	0.037	0.172
	Δ song intensity (after – before earthquake)	depth + magnitude + distance to earthquake origin + received energy at hydrophone + **song intensity before*** + day of year + factor(hydrophone unit)	1.691	0.051	0.090