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EFFECTS OF WIND-GENERATED UNDERWATER NOISE ON SOUTHERN RIGHT WHALE GROUP DYNAMICS

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The goal of this study was to investigate whether underwater noise affects the grouping behavior of southern right-whale (*Eubalaena australis*) mother-calf pairs at Península Valdés, Argentina. This area is a major calving ground for the population that occupies the western South Atlantic. Two large gulfs with gradually sloping beaches provide perfect conditions for mothers to protect their calves. Mothers concentrate in shallow water along the shoreline so that predators can approach only from offshore. Southern right whales use an “up-call” to contact each other. Being in a group lowers an individual’s vulnerability to predators. There is an overlap in frequency between the up-call and underwater noise caused by wind. Distortion or masking of the up-call may change the ability of whales to locate one another and thereby alter whale grouping in times of high underwater noise. Wind creates underwater noise through turbulence at the surface. In this study we used wind speed as a proxy for underwater noise. Whale group sizes were assessed during aerial surveys, and were used to indicate the average proximity of whales on a given day. Wind speed data for the calving ground was provided by NOAA’s ERDDAP data server. Correlations between wind speed and whale proximity were interpreted as evidence that underwater noise affects the ability of whales to hear each other. We found significant relationships between increased underwater noise caused by higher wind speeds and increased numbers of whales in groups. The effect of underwater noise (wind) on whale grouping decreases with the time before an aerial survey. The exceptions are 12 and 36 hours before a survey. Wind speed 12 hours before a survey has a large and very highly significant effect on the tendency of whales to form groups. Unexpectedly, wind speed 36 hours before a survey also has a significant, but negative, effect on grouping.