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2015. Casey, C., Costa, D., and Reichmuth, C. Vocal dialects of the northern elephant seal: changes in geographic variation in a recovering species. *21<sup>st</sup> Biennial Conference on Marine Mammals*, San Francisco, United States, 13 December – 18 December. (Presentation abstract).

## **Vocal dialects of the northern elephant seal: changes in geographic variation in a recovering species**

Species-typical acoustic signals can vary dramatically between individuals and across geographically isolated populations, yet the selective pressures that drive such differences are often unknown. Northern elephant seals (*Mirounga angustirostris*) provide the opportunity to examine the ecological, demographic, or genetic factors that contribute to signal divergence. Historical recordings of ritualized male calls suggested the presence of vocal dialects (call types specific to a geographic region) among four discrete breeding populations. In contrast, more recent findings indicate that males produce individually unique vocal signatures, and that variation between individuals supports accurate recognition of rivals. To determine whether the vocal behavior of male northern elephant seals has in fact changed over time, we recorded 315 adult males across their geographic range, and compared these calls to historic recordings made when the population was one-third of its current size (ca. 1970). We analyzed calls from eight current breeding sites, including the four colonies for which historic data were available. We find that vocal dialects have diminished, while variation between individuals has increased at most sites: vocalizations of males from historic recordings show marked regional homogeneity, while vocalizations produced by males at the same sites now exhibit more complex call structure and variation in tempo. Additionally, we found differing amounts of acoustic variation at the eight contemporary breeding sites. Call differentiation among males was most pronounced at older colonies with relatively high density. This is likely the result of elevated competition between individuals at crowded rookeries, and more time available for new call patterns to emerge at these sites. These findings demonstrate geographic and generational changes in acoustic signaling within a rapidly recovering population, and help to identify the mechanisms of signal divergence in animals that rely on acoustic communication. [Supported by National Geographic Society]