

# Cassin's Auklet Foraging and Their Euphausiid Prey in a Variable Environment

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Climate change has led to widespread shifts in ocean conditions, resulting in changes to the distributions, seasonal habits, and population sizes of species. We set out to understand how changes along the California coast are impacting an important prey resource, krill (*Euphausiids*), and one of its seabird predators, the Cassin's auklet (*Ptychoramphus aleuticus*).

The study used ten years of survey data collected off the coast of north/central California as part of the Applied California Current Ecosystem Studies (ACCESS) program ([www.accessoceans.org](http://www.accessoceans.org)), a partnership of the Greater Farallones National Marine Sanctuary, Cordell Bank National Marine Sanctuary, and Point Blue Conservation Science. Data were collected between April and October 2004–2013.

Using statistical models, we determined that both krill and Cassin's auklets respond to

ocean-basin scale climate as well as local oceanic conditions, such as the presence of upwelled waters. For krill abundance, local ocean conditions were more important, while large-scale climate conditions were most important for Cassin's auklet.

Our study identified two key areas of persistent overlap between Cassin's auklets and their krill prey: Cordell Bank and the Farallones Escarpment. This result corroborates the value of these biological hotspots. Both models and diet samples highlight the negative response of Cassin's auklets to anomalously warm conditions, at least in part due to associated decreased availability of krill.

Projected future increases in the frequency and magnitude of anomalously warm ocean conditions and El Niño are likely to lead to declines in both krill availability and the Cassin's auklet population breeding on

the Farallon National Wildlife Refuge.

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## Main Points

- Krill and Cassin's auklet abundance were predicted by both local ocean conditions and larger-scale climate.
- Cordell Bank and the Farallones Escarpment are key areas for both Cassin's auklets and krill.
- Future declines in krill and Cassin's auklets are likely as ocean temperatures increase with climate change.

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Suzanne Manugian, Meredith L. Elliott, Russ Bradley, Julie Howar, Nina Karnovsky, Benjamin Saenz, Anna Studwell, Pete Warzybok, Nadav Nur, Jaime Jahncke. 2015. Spatial Distribution and Temporal Patterns of Cassin's Auklet Foraging and Their Euphausiid Prey in a Variable Ocean Environment. PLoS ONE. 10(12).