

West Coast marine mammals respond to shifting conditions, new research shows

December 16 2015



Sea otters have now reached carrying capacity on parts of the Central California Coast, scientists report. Credit: NOAA/National Ocean Service

Humpback whales off the West Coast consume thousands of pounds of krill, plankton and small fish each day. Research shows that humpback

diets reflect their surroundings, with the truck-sized whales filter-feeding on vast amounts of krill when cold upwelling waters prevail, but switching to schooling fish such as anchovies when warmer waters take over and the fish grow abundant.

The findings presented at the [Society of Marine Mammalogy's Biennial Conference](#) in San Francisco demonstrate that humpback foraging responds to environmental changes, and illustrates how marine mammals serve as sentinels of ever-changing ocean conditions. "Whales can be great indicators but only if we know what they are indicating," said Alyson Fleming, a postdoctoral researcher at the Smithsonian Institution who is lead author of the study. "Once we know that, they can shed light on the whole ecosystem as it is today and help us predict what it might look like in the future."

The Society's conference has attracted more than 2,000 marine mammal researchers, agency representatives, educators and conservation groups to San Francisco for its first return to California in 25 years. "This is the world's largest meeting of [marine mammal](#) professionals, and the place we all compare notes and look for patterns and trends that help us piece together important changes out in the ocean," said NOAA Fisheries research scientist Jay Barlow, a co-author of the new humpback research and president-elect of the Society.

Many presentations at the meeting revealed new details about the West Coast's diverse mix of marine mammals from whales to otters, including:

- Harbor porpoises are recolonizing San Francisco Bay and Puget Sound after decades of absence. The porpoises disappeared abruptly from San Francisco Bay when World War II shipyards sprang up and vessel traffic increased. Marine scientists speaking at the conference said the return of the popular and highly visible porpoises that were once frequent fixtures reflect habitat

recovery and improved ecosystem health.

- Sea otters are recovering in key areas of southern and central California, and through their role as an apex predator they are helping to restore ecosystem health by keeping populations of sea urchins in check and preying on invasive species, for example. Otters have reached environmental carrying capacity in central parts of the state, especially from Monterey to Morro Bay, but recovery in other areas has recently been hemmed in by increased mortality from shark-bites, studies show. In Elkhorn Slough, south of Santa Cruz, otters have recolonized estuary habitat and appear to be thriving in unexpected ways, while boosting the health of eel grass and salt marsh ecosystems. Research on this population suggests that it could provide a model for an eventual return to San Francisco Bay, where historical records indicate thousands of sea otters once thrived prior to the fur trade. "The real story here is that we probably need sea otters more than they need us, as they play key roles in the functioning and resiliency of kelp forest and estuarine ecosystems that provide a wide range of services to human societies," said Dr. M Tim Tinker, a research scientist with the U.S. Geological Survey who is presenting an overview of the latest research on southern [sea otters](#) and is coauthor of several other new studies presented at the conference.
- New mapping of blue whale feeding areas off Northern California show that the areas, which include high densities of krill, also overlap with busy San Francisco shipping lanes. The findings suggest that seasonal speed restrictions on ship traffic may reduce the threat of deadly ship strikes.
- The ongoing stretch of record California sea lion strandings along the California Coast that began in 2013 coincided with a change in the diet of [sea lions](#) from high-energy anchovies and sardines. The sea lions switched to leaner market squid, shortbelly rockfish and other less-common prey such as mackerel

and hake, according to new studies of their scat. Unusually warm ocean conditions have led to species shift along the West Coast, which continue reverberating through the marine food web.



New research indicates that humpback whale foraging responds to environmental conditions, scientists reported at the conference of the Society of Marine Mammalogy in San Francisco this week. Credit: NOAA Fisheries/SWFSC

Shifting conditions off the West Coast are continuing this winter with the arrival of an El Nino climate pattern, which in the past have typically affected marine mammals, their habitat and the species they prey on. Sea lions are only one example of the species affected by a changing environment, but they also may be more vulnerable than more mobile whales, dolphins and porpoises, Barlow said.

"We've seen a record warm year off California in 2014 and this year is

lining up to be a huge El Nino," he said. "We are seeing many changes in the distribution of whales and dolphins. However, I worry more about climate changes affecting pinnipeds than cetaceans. Pinnipeds are tied to land sites for molting and pupping whereas cetaceans can move fluidly in response to changing conditions."

Provided by NOAA Headquarters

Citation: West Coast marine mammals respond to shifting conditions, new research shows (2015, December 16) retrieved 30 April 2024 from <https://phys.org/news/2015-12-west-coast-marine-mammals-shifting.html>

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