

## **Excerpt from: Information on Recent Strandings and Non-traditional Haulout Sites Used by Pinnipeds in California**

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There was a disruption in the coastal upwelling process off central and northern California during May and June, at a time when it is normally strong. It is possible that this disruption may have affected the ecosystem adversely and therefore it may be tied to the unusual animal mortalities observed along the coast. Coastal upwelling along the U.S. West Coast is driven by equatorial winds, so changes in the normal wind pattern would lead to disrupted upwelling. It is still not known what caused the anomalous wind pattern, but in the absence of upwelling and wind-driven mixing, the water column will tend to stratify, leading to warming and decreased primary production in surface waters. This would, in turn, result in an impoverished food web. Stratification and warming of the surface waters nearshore may also lead to dinoflagellate red tides and possibly harmful algal blooms, as a secondary effect.

California sea lions have been stranding at a very high rate in central and southern California so far in 2009, especially since May. Many stranding network facilities have already admitted more animals this year than in all of 2008, and some are fully extended and reaching capacity. Most of the stranded animals coming into the mainland are yearlings, following last year's record number of 59,000 California sea lion pups born on the rookeries. In addition to the stranded yearlings, the highest pup mortality in the first month of life ever recorded was observed in 2009 at two offshore California sea lion rookeries (San Miguel Island and San Nicolas Island) by NMFS National Marine Mammal Laboratory scientists. On San Miguel Island, 6,000 pup mortalities were observed where the typical average is 1,000-1,500 for the same time period. On San Nicolas Island, 1,900 pup mortalities were observed where the typical average is 250 for the same time period. On both Islands, the pup production this year was lower than what is expected (on San Miguel typically 18,000 pups are born and on San Nicolas 10,000 pups are born). Starvation appears to be the primary cause; stranded animals are weak and emaciated. Additionally, reports of large numbers of sea lions hauled out (but not yet stranded) in non-traditional areas, including docks and harbors, are increasing, particularly for this time of year.

We anticipate that this situation could continue through next year, particularly if El Niño conditions persist or strengthen, which would begin impacting Californian waters in the next few months. We would also anticipate an increase in northern fur seal (*Callorhinus ursinus*) strandings in October through December of this year. The numbers of California sea lion strandings began to increase beyond typical levels in May and peaked in June and while the numbers of animals stranding have decreased in July, they are still higher than historical levels at this time of year. Harbor seal and northern elephant seal (*Mirounga angustirostris*) strandings are fairly typical for this time of year; however, an unusual parasite (*Otostrongylus circumlitis*) was recorded in both elephant seals and harbor seals in April, May, and June of this year and was likely transmitted via prey. The last time this parasite was observed was in 1998. NMFS staff continue to consult with other NOAA staff and external colleagues to investigate oceanographic or climate phenomena that may further explain what is currently being documented with these marine mammals.

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