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Great Ocean Conditions in Central California in 2010

PRBO Conservation Science (PRBO) in collaboration with NOAA's Cordell Bank and Gulf of the Farallones National Marine Sanctuaries monitored oceanographic conditions, zooplankton, and marine birds and mammals in central California. The 2010 cruises indicated an abundance of krill and krill-eating predators that occurred in spite of widespread El Niño conditions in the region.

Delayed and weak upwelling and warmer sea surface temperatures characterized the first few months of 2010. This was evidenced by the Pacific Decadal Oscillation index (PDO, fig. 1), which indicated warmer temperatures for most of winter and spring. In contrast, the North Pacific Gyre Oscillation index (NPGO, fig. 2) remained high, suggesting overall good ocean conditions along the California Current.

El Niño generally results in limited food supply that negatively affects wildlife across the region. This was an exception in 2010, when an abundance of krill was made evident during hydro-acoustic surveys and net sampling. The krill species *Euphausia pacifica* was most abundant throughout the year. *Thysanoessa spinifera* was observed in higher numbers during summer. Surface swarms of *Thysanoessa spinifera* were observed during the fall cruise.

Remarkable numbers of Cassin's Auklets and baleen whales were seen foraging over the shelf and shelf break. The abundance of krill allowed auklets on the Farallon Islands to breed for a second time, with exceptionally high breeding success not previously recorded at this colony. Auklets were very common in the region into

the fall (fig. 3). Unprecedented high numbers of humpback (fig. 4) and blue whales were observed in 2010 relative to previous years.

Other wildlife observed during cruises included Common Murres, Brandt's Cormorants, Sooty Shearwaters and Black-footed Albatrosses, among others. For more information on these cruises visit the Applied California Current Ecosystem Studies Partnership at www.accessoceans.org.

Main Points

- El Niño reached the California Current in winter and spring 2010.
- Delayed, weak upwelling and elevated ocean temperatures were observed in winter and spring.
- High abundance of krill was observed by hydroacoustics and net sampling.
- Large numbers of Cassin's Auklets and baleen whales were attracted to the abundance of krill in the region.

For more information see

Elliott, M. and J. Jahncke. 2011. Central California Pelagic Ecosystem Studies – 2010 Status Report (<http://www.prbo.org/cms/561>)

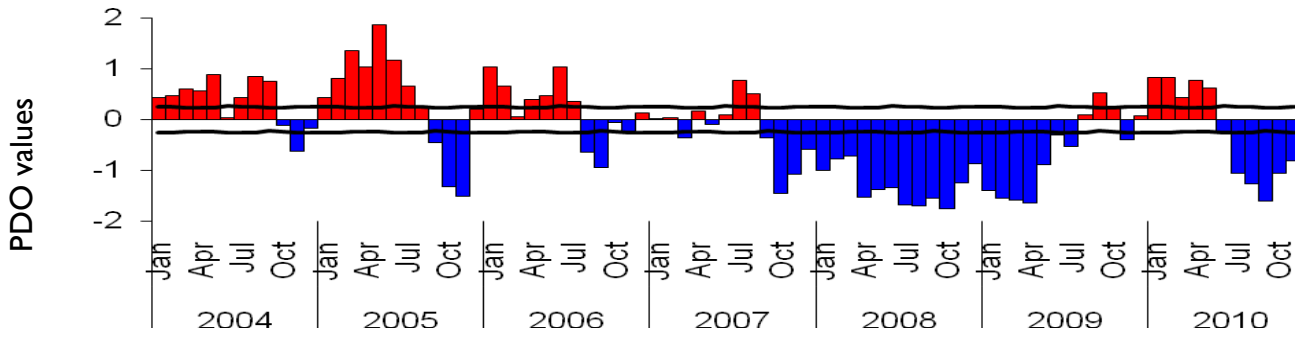


Figure 1. Pacific Decadal Oscillation (PDO) values from 2004 to November 2010. Black lines represent the 99% confidence intervals around the long-term monthly means (<http://jisao.washington.edu/pdo>)

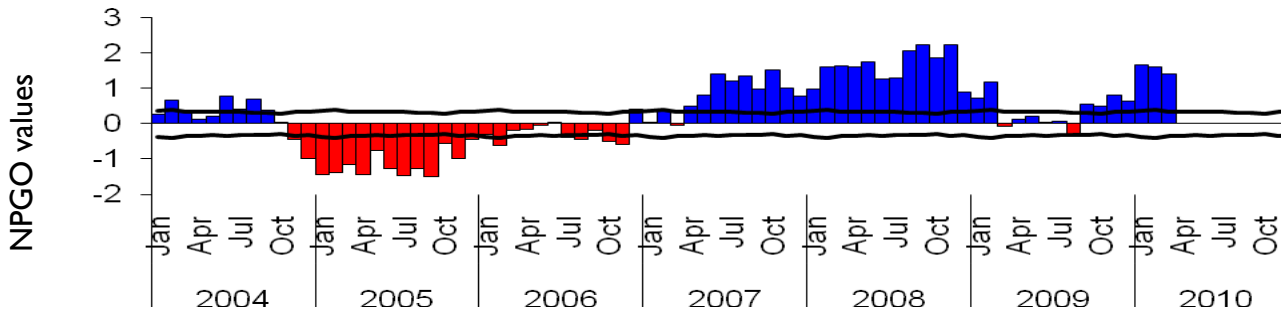


Figure 2. North Pacific Gyre Oscillation (NPGO) values from 2004 to March 2010. Black lines represent the 99% confidence intervals around the long-term monthly means (<http://www.o3d.org/npgo>).

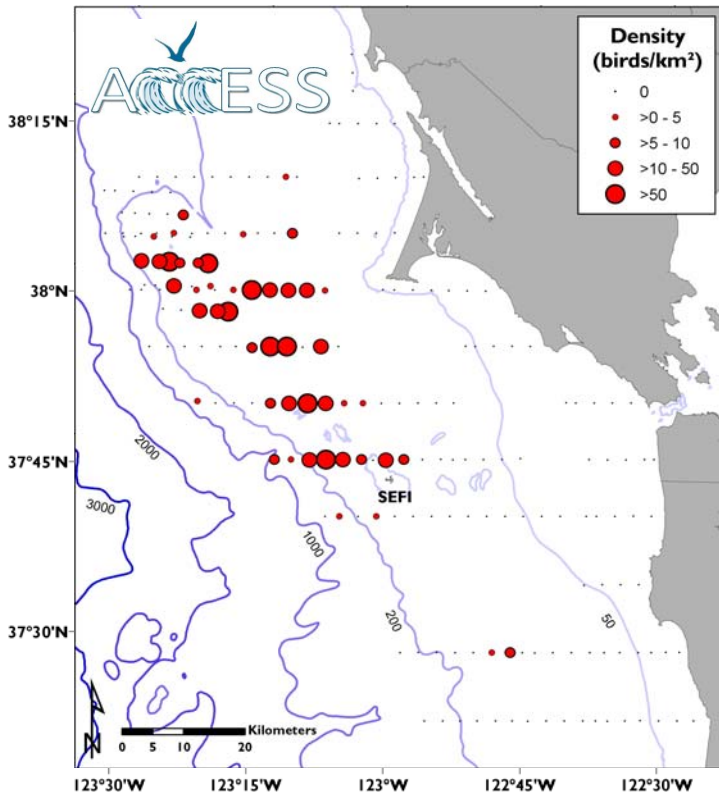


Figure 3. Distribution and abundance of Cassin's Auklet during the September 2010 ACCESS cruise.

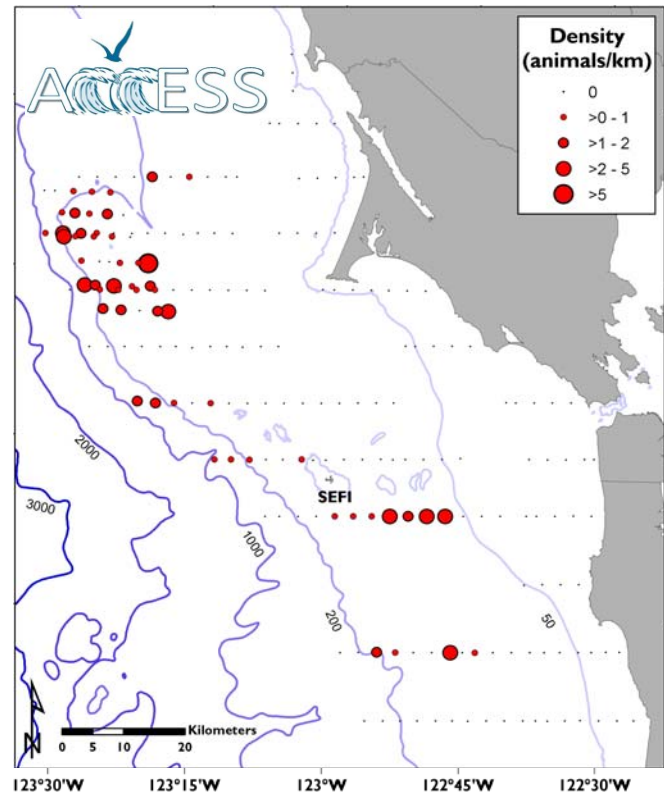


Figure 4. Distribution and abundance of Humpback Whale during the September 2010 ACCESS cruise.