Ecosystem Survey of *Delphinus* Species

27 September 2009

Weekly Report No. 3: 20-26 September 2009

Susan Chivers, Cruise Leader

This was another successful sampling week for us. We started the week just south of the northern Channel Islands and surveyed along our pre-planned track lines in the middle portion of the Southern California Bight. We collected a full suite of data along the way: sightings and effort data, photographs, biopsy samples and oceanographic data. Again, our most frequently sighted cetacean species were the two species of common dolphin. While both species were seen in close proximity to each other as we have noted previously, no mixed species schools were observed this week, and most sightings were around islands and near shore. In areas where common dolphins were few, we would often see other cetacean species, and in some places it was fin whales and in others it was Risso's, bottlenose, and Pacific white-sided dolphins. Changes in water temperature, productivity and other oceanographic data were evident and likely reflect differences in the prey species available. These patterns characterize each cetacean species' habitat and will help provide a better understanding of their ecological similarities and differences. The most unusual sighting of the week was a Red-footed Booby, which are a tropical species and a regular follower of ships in the eastern tropical Pacific but not here. We also saw some tuna and billfish jumping, which are also most typically associated with tropical waters. Could these be signs of El Niño?

We sighted our second group of killer whales this week in Santa Monica Bay. We collected a couple of samples for molecular genetic analyses and photographs to identify the individuals. Two of the whales were easily identified from marks on their dorsal fins. When Alisa Schulman-Janiger, who identifies killer whales in the California area, was contacted, she was able to tell us that one of them was first sighted in 1997 and the other has been seen with members of the group of killer whales we encountered last week off Point Conception.

NOAA FISHERIES SERVICE

Southwest Fisheries Science Center

Protected Resources Division

CHIEF SCIENTIST:
Susan Chivers

CRUISE LEADER:
Susan Chivers

AT-SEA SCIENTISTS (A-Z)
James Cotton
Michael Force
Justin Garver
Siri Hakala
Candice Hall
Nick Kellar
Rich Pagen
Robert Pitman
Richard Rowlett
Juan Carlos Salinas
Corey Sheredy
Ernesto Vázquez
Sophie Webb
Suzanne Yin

AERIAL TEAM
James Gilpatrick
Morgan Lynn
Fionna Matheson
Wayne Perryman (Program Lead)

ADDITIONAL PRD INFORMATION:
http://swfsc.noaa.gov/prd.aspx

ADDITIONAL CRUISE INFORMATION:
http://swfsc.noaa.gov/prd-delphinus.aspx

Fog limited the work we planned to do with the NOAA Twin Otter this week to Thursday, Friday and Saturday. But those three days were great days with clear skies and light winds. The aerial team was able to collect high quality digital images from many groups of both common dolphin species as well as a few whales of different species and some Risso's dolphins. Six of the common dolphin groups were photographed with the ship nearby, and the shipboard observers estimated group size for each. These images will be used to calibrate observer estimates of group size and incorporated in the estimation of abundance.

More information about individual projects, including summaries of data collected, follow. Additional information about the project and past weekly reports can be found on our cruise website: http://swfsc.noaa.gov/prd-delphinus.aspx.

Bottlenose dolphin. Photo credit: Suzanne Yin.

Photography Report – James Cotton, Suzanne Yin, Sophie Webb & Nick Kellar

Plane/vessel simultaneous sampling is a coordinated effort from the two research platforms to obtain overhead images of dolphin schools for animal length measurements. By comparing the resulting dolphin length distributions of animals that ride the bow (vessel images-see "Vertical Bow Photography" description from Week 1 report) to the those from the general school (aerial images), we are investigating whether certain age classes or demographic groups (using length as a proxy for age) are disproportionately more likely to ride the bow. This will help inform us how well biopsy samples, which are obtained mostly from bowriders, represent groups of animals (schools, populations, stocks, etc.). In other words, we are attempting to assess whether biopsy sampling is random with respect to life-history state for the cetaceans we study.

During this cruise, there have been seven of these plane/vessel simultaneous sampling exercises (five on long-beaked schools and two on short-beaked schools); six were done this week. From these we have taken 2327 images of both species from the bow of the research vessel and many more from the airplane. From observations during this cruise and others, it appears that all age classes bow-ride, from the several-month-old neonates to the largest adults. The real question is: do they do this proportionally to their representation in the population?

Long-beaked common dolphin. Photo credit: Robert Pitman.

Aerial Photography Report – Wayne Perryman, Morgan Lynn, Jim Gilpatrick & Fionna Matheson

Despite only being able to fly for 3 days out of the last week (due to fog), the Aerial Photogrammetry Team managed to photograph 28 separate sightings. These include 6 calibration schools. Species photographed include *Delphinus delphis* and *D. capensis*, Fin Whales (2 sightings), Humpback Whales (1 sighting), Blue Whales (1 sighting) and Risso's dolphins (2 sightings). Through Friday, we have flown 22.6 hours of which 5 hours were paid for by the National Marine Sanctuary and 17.6 hours by this project.well. We flew 1.2 hrs on the 17th trying to find a hole in the fog but didn't find one. We are still waiting for a break in the weather.

Seabird Report – Michael Force & Sophie Webb

It was a fantastic week for the seabird team. Even though we're working pretty much the same general area as the last couple of weeks, we found 39 species, tying our previous high total. A lot of this is a result of odd-ball non-marine species finding the *McArthur II* a welcome place to rest. These include a Burrowing Owl, Blackpoll Warbler, Peregrine Falcon, American Kestrel, several Mourning Doves, Chipping and Lark Sparrows, the ubiquitous Brown-headed Cowbird, and an unidentified oriole. Not much has changed in the seabird department. Feeding flocks over dolphins continue to consist primarily of Pink-footed, Sooty, and Black-vented Shearwaters (near shore flocks), Western and Heermann's Gulls, Elegant Terns and Brown Pelicans, along with a scattering of jaegers. The big surprise was the immature dark morph Red-footed Booby that settled on the jackstaff Sunday evening, about nine nautical miles east-southeast of Anacapa Island. It spent the night on board, rode the ship into Santa Monica Bay, and departed early the next morning about two nautical miles southwest of Dana Point. This wide-ranging tropical seabird is a very unusual visitor to southern California waters. The last one to show up, 29 September 2008, also hitchhiked on a ship, riding a commercial fishing charter from Ensenada

to San Diego harbor. Least Terns and a single Forster's Tern were the first we've seen this trip, making this a big week for terns (six species). A flock of almost 1000 Arctic Terns illuminated by the late evening sun southeast of San Nicolas Island resembled suspended snow against the dark sea.

Oceanography Report – Candice Hall, Justin Garver, Siri Hakala & Corey Sheredy

We've broken into triple figures for surface chlorophyll samples this week, providing invaluable high density productivity data within our survey area. Our track line has crossed the shelf break many times, going from less than 100m to over 1500m in a matter of minutes, as shown in the depiction below (2009, Ben Waltenberger),

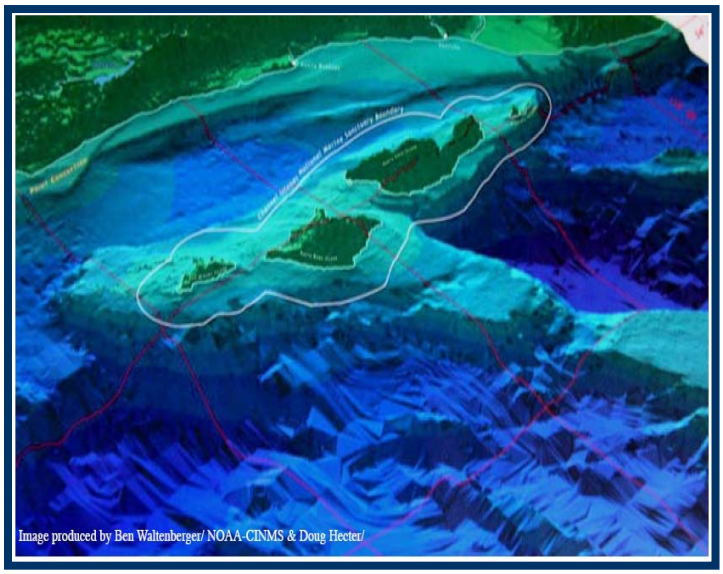

Figure 1Figure depicting the hydrograhpy around the Channel Islands (http://www.islandpackers.com/ipcoWebpdf/Marine_mammals.pdf.)

allowing us to record temperature and salinity levels from the water surface to as close to the bottom as possible. It will be interesting to correlate the hydrography of the region to the distribution of the Delphinus schools once this survey is complete. Surface water temperatures have averaged at 18.99 °C this week, potentially reflecting the warmer waters flowing northwards from Mexico. Of unrelated interest was a visit by a large *Mola mola* during this morning's CTD, encouraging spectators to gather on deck during the early morning CTD station.This has been an exciting week for the mid-trophic crew, as we have been seeing an increasingly diverse assortment of fish and zooplankton caught in our net tows. This diversity has been particularly evident in our near shore tows. We have also had a few nights of excitement during our squid jigging stations. At one of our stations near Catalina Island, our team managed to dip-net a California Flyingfish as it swam by the ship. This was quite exciting catch, given the fact that it was our first specimen caught during squid effort. However, the flyingfish was outdone two nights later by our first squid. It was a small *Dosidicus gigas* approximately 18 inches in length (see photo). The squid was quite a boost for us, and we are hopeful that we will start seeing an increase in squid caught as we make our way to the southern track lines.

Outreach and Education Report – Siri Hakala

The wiki continues to gather followers, and our internet connection is now allowing me to post videos! Lacey O'Neal (Senior Survey Technician) and Art Mercado (Chief Steward) graciously allowed themselves to be interviewed on video for a future "Who's Who" section. The officers and crew were also very accommodating in letting me film the fire drills when John Forgione and ENS Petersen donned their fire fighting gear to battle a mock blaze in the ship's office.

We now have four schools and the BeWise (Better Education for Women in Science and Engineering) program signed up for the ship tours on November 10th. The plan for next week is to review all the video footage and photographs I've gathered and fill in the gaps.

You can check out our wiki at the following website: http://www.sbsd.k12.ca.us/groups/noaa/.
Username: noaaproject
Password: read

Line transect Survey Report: Juan Carlos Salinas, Jim Cotton, Rich Pagen, Richard Rowlett, Ernesto Vázquez & Suzanne Yin

The survey tracklines we covered this week were predominantly in the middle of the Southern California Bight. We were near San Nicolas, Santa Barbara and Santa Catalina Islands during the week. We again saw many schools of our study species: long- and short-beaked common dolphins in schools of all sizes that were tightly aggregated or in small, spreadout clusters. No mixed schools of common dolphin species were seen this week.

Risso's dolphins. Photo credit: Suzanne Yin

Summary of Marine Mammal Effort

Date	Time	Position		On Effort Survey Miles (nm)	Average Beaufort
092009	1006	N33:08.60	W119:40.11	41.0	3.1
	1812	N33:52.08	W119:15.87		
092109	0658	N34:00.10	W118:51.80	47.0	3.2
	1842	N33:06.78	W119:20.09		
092209	0658	N33:04.13	W119:23.30	82.7	4.6
	1825	N33:35.22	W118:34.15		
092309	1515	N33:33.85	W118:49.05	18.6	3.9
	1834	N33:16.89	W118:34.98		
092409	0648	N33:16.01	W118:30.35	52.5	2.6
	1812	N33:53.24	W118:38.01		
092509	0654	N33:56.17	W119:11.86	42.6	2.4
	1834	N33:57.10	W119:38.44		
092609	0655	N33:51.61	W119:53.23	26.5	3.3
	1203	N33:50.46	W119:38.24		

Summary of Marine Mammal Sightings

Species	Number of groups
Delphinus sp.	14
Delphinus capensis	31
Delphinus delphis	14
Tursiops truncatus	7
Grampus griseus	12
Lagenorhynchus obliquidens	7
Orcinus orca	1
Physeter macrocephalus	1
Ziphiid whale	1
Balaenoptera sp.	8
Balaenoptera acutorostrata	2
Balaenoptera physalus	11
Balaenoptera musculus	2
Megaptera novaeangliae	2
Unid. dolphin	1
Unid. small delphinid	2
Unid. medium delphinid	2
Total	118

Photographs Taken – Jim Cotton, Suzanne Yin, Sophie Webb & Nick Kellar

Species	Common Name	No. of Sightings this week	No. of Photos this week	Total No. of Sightings	Total No. of Photos
Balaenoptera musculus	Blue whale	0	0	3	11
Balaenoptera physalus	Fin whale	1	8	6	308
Delphinus capensis	Long-beaked common dolphin	22	5289	45	15325
Delphinus delphis	Short-beaked common dolphin	11	2568	34	10704
Grampus griseus	Risso's dolphin	2	17	5	146
Lagenorhynchus obliquidens	Pacific white-sided dolphin	2	44	6	1752
Orcinus orca	Killer whale	1	52	2	524
Tursiops truncatus	Bottlenose dolphin	5	128	7	333

Biopsy Samples Collected – Juan Carlos Salinas, Ernesto Vázquez, Rich Pagen & Robert Pitman

Species	Common Name	Weekly No. of Samples	Weekly No of Takes	Total No. of Samples	Total No. of Takes
Balaenoptera physalus	Fin whale	0	0	1	1
Delphinus capensis	Long-beaked common dolphin	106	168	311	517
Delphinus delphis	Short-beaked common dolphin	54	87	237	398
Lagenorhynchus obliquidens	Pacific white-sided dolphin	0	0	9	15
Lissodelphis borealis	Northern right whale dolphin	0	0	1	1
Orcinus orca	Killer whale	2	2	8	9
Tursiops truncatus	Bottlenose dolphin	10	14	24	34

Oceanography Samples Collected and Stations Completed – Candice Hall, Justin Garver, Siri Hakala & Corey Sheredy

Date	CTD	Surface Chlorophyll	HAB	UCTD (XBT)	Squid Stations	Bongo Tows	IKMT
09/20/09	1	6	4	6(0)	1	1	1
09/21/09	1	6	4	6(0)	1	1	1
09/22/09*	1	5	4	7(1)	1	1	1
09/23/09**	1	5	4	16(0)	1	1	1
09/24/09*	1	6	4	7(1)	1	1	1
09/25/09	1	6	4	6(0)	1	1	1
09/26/09	1	6	4	6(0)	1	1	1
Week Total	**7**	**40**	**28**	**22 (2)**	**7**	**7**	**7**
Grand Total	**19**	**111**	**76**	**87 (17)**	**18**	**20**	**16**

* Comparative CTD, UCTD & XBT stations 1 & 2.
** Leg 1 UCTD Yo-Yo station # 2 (12 continuous casts), plus a comparative CTD.

Corey Sheredy and Justin Garver proudly displaying their catch (*Dosidicus gigas*). Photo credit: Candice Hall.