

**STAR 2006: NOAA Ship *David Starr Jordan*
Weekly Science Report**

*Robert Pitman, Cruise Leader
7 September 2006*

Science Summary: 31 August – 6 September 2006

This week our high winds gave way to torrential rains as we dipped into the ITCZ – a rainy belt that girdles the tropics; for a while there the only time it quit drizzling was when it was pouring. (DSJ = NOAA's ark). Marine mammal sightings during our 4 days of survey were predominantly striped and bottlenose dolphins but we did have two sightings of humpback whale cow/calf pairs – these were doubtless southern humpbacks that had traveled to the Northern Hemisphere to have their calves; in a few months they will be back down in Antarctica. Not many animals on this planet annually commute between pack ice and palm trees.

We were quite a bit ahead of schedule late in the leg and so we pulled into Cocos Island for half a day. Cocos Finch, Cocos Flycatcher, Cocos Cuckoo - their entire world is a small green mountain on a saltwater planet. Thirty years ago this lush tropical island was uninhabited and rarely visited. Now there is a ranger station, a research station and when we visited last week there were 7 boats in Chatham Bay alone (besides us: 3 longline fishing boats, 2 dive boats, a Costa Rican patrol boat). It is amazing how many people you can find on a deserted tropical island.

The end of another leg means we must once again say Adios to some of group: our foreign observers, Francisco Cordova (El Salvador) and Christian Naranjo (Ecuador), were a big help with our oceanographic operations and net tows, and we appreciate their efforts. Our captain, Alex von Saunder, handed over her command duties to Keith Roberts during this import; she finished up her tour and went back to Seattle. Messman Mike Sapien is going home to be with his ailing father; we wish you well Mike and look forward to having you back later in the cruise. But most of all we will miss our Squid Lady – Iliana Ruiz-Cooley; boundless energy and a pure joy to sail with, you can come back with your squid jigs and join us any time.

The sound of slapping flippers and the sweet smell of sea turtle breath were too infrequent on our back deck this last week – we look forward to better weather and lots of animals next leg.

Sightings and Effort Summary for Marine Mammals

Date	Start/ Stop Time	Position	Total nm	Average Beaufort
083106	0605	N05:49.10 W091:01.33	48.3	3.2
	1453	N05:33.13 W089:53.60		
090106	0545	N05:27.58 W087:51.80	35.5	2.7
	1006	N05:34.99 W087:12.57		
090206	0554	N06:12.18 W087:55.30	41.0	3.7
	1745	N07:12.83 W087:02.16		
090306	0548	N08:35.98 W087:10.42	50.4	2.8
	1732	N08:42.18 W085:44.88		
090406	-	-	In port	-
	-	-		
090506	-	-	In port	-
	-	-		
090506	-	-	In port	-
	-	-		

Code	Species	Number of Sightings
002	<i>Stenella attenuata</i> (offshore)	2
010	<i>Stenella longirostris orientalis</i>	1
013	<i>Stenella coeruleoalba</i>	15
015	<i>Steno bredanensis</i>	3
017	<i>Delphinus delphis</i>	1
018	<i>Tursiops truncatus</i>	8
021	<i>Grampus griseus</i>	4
036	<i>Globicephala macrorhynchus</i>	1
049	Ziphiid whale	1
051	<i>Mesoplodon</i> sp.	1
076	<i>Megaptera novaeangliae</i>	2
077	unid. dolphin	1
096	unid. cetacean	1
Total		41

Biopsies (Juan Carlos Salinas Vargas and Ernesto Vázquez Morquecho)

Species	Common Name	Weekly total		Total-to-date	
		Samples	Takes	Samples	Takes
<i>Stenella attenuata</i>	Pantropical spotted dolphin	0	0	12	23
<i>Stenella longirostris orientalis</i>	Eastern spinner dolphin	0	0	6	20
<i>Stenella longirostris</i> subsp.	unidentified spinner dolphin	0	0	21	33
<i>Stenella coeruleoalba</i>	Striped dolphin	0	0	1	3
<i>Delphinus delphis</i>	Short-beaked common	0	0	15	32
<i>Steno bredanensis</i>	Rough-toothed dolphin	1	1	3	3
<i>Tursiops truncatus</i>	Bottlenose dolphin	10	19	24	43

Species	Common Name	Weekly total		Total-to-date	
		Samples	Takes	Samples	Takes
<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	10	25	18	44
<i>Physeter macrocephalus</i>	Sperm whale	0	0	8	8
<i>Balaenoptera edeni</i>	Bryde's whale	0	0	3	3
<i>Balaenoptera musculus</i>	Blue whale	0	0	8	16
Total		21	45	119	228

Photo Project (Cornelia Oedekoven and Laura Morse)

Photo-Id came back to life. Although no spotted dolphins were photographed this past week, and spinner dolphins were still running away (two of our most cooperative subjects during some of our previous encounters), we were able to add a few dolphin schools to our count. The one spinner school we photographed consisted mostly of eastern spinners which are usually overall gray. A small percentage of dolphins, however, were white-bellied spinners and a fair amount of the eastern spinners showed partially white bellies. Finally we added some 'nice' striped dolphin images. This species seems to always run away from the ship in the eastern tropical Pacific, generally resulting in a selection of tail pictures. This week a few of the schools decided to run off in a direction perpendicular to us, providing views of the dolphins that were still distant but yet lateral. Rough-toothed dolphins were again the most cooperative subject, allowing full body shots of leaping dolphins and close-ups of surfacing animals where the open eye is visible under water (the song 'Eye of the Steno' has become very popular during evening image viewing sessions). On the artistic side, a fantastic image was taken by Adam from the flying bridge of a pilot whale breaking the surface near the ship showing the reflection of the ship and surrounding skies and waves in the bulbous melon of the whale.

Species	Weekly Photographs		Total-to-date	
	Individuals	Schools	Individuals	Schools
<i>Stenella attenuata</i> (offshore)				10
<i>Stenella attenuata</i> (unid)				1
<i>Stenella longirostris orientalis</i>		1		4
<i>Stenella longirostris</i> (unid)				5
<i>Stenella coeruleoalba</i>		4		6
<i>Delphinus delphis</i>		1		11
<i>Steno bredanensis</i>		1		7
<i>Tursiops truncatus</i>		3		12
<i>Grampus griseus</i>		1		6
<i>Globicephala macrorhynchus</i>		1		2
<i>Berardius bairdii</i>				3
Unid. Ziphiid				1
<i>Physeter macrocephalus</i>			20	
<i>Megaptera novaeangliae</i>	1		1	
<i>Balaenoptera edeni</i>				1
<i>Balaenoptera borealis/edeni</i>				5
<i>Balaenoptera physalus</i>			2	
<i>Balaenoptera musculus</i>			15	
Total	1	12	44	68

Seabirds and Marine Debris (Rich Pagen and Chris Cutler)

Considering only four days of survey effort this week, seabird species diversity was quite high. Some highlights for the week included a Dark-rumped Petrel, Markham's and Harcourt's Storm-Petrels materializing among the ubiquitous Galapagos Storm-Petrels, and scattered solo Tahiti Petrels. As we approached Cocos Island, flocks of White Terns, Brown and Black Noddies, and Brown Boobies ushered us to our anchorage. While ashore on the island, Great Frigatebirds and Red-footed Boobies provided endless entertainment in the trees and soaring overhead, while pairs of hyperactive, endemic Cocos Island Finches noisily zipped from limb to limb, gleaning food from the branches. Our CTD stop that evening was graced by the presence of a dozen or so Audubon's Shearwaters buzzing around the ship like "little wind-up toys."

Our one frantically busy period this week was actually not the result of a lot of birds, but rather a lot of marine debris (unfortunately). For about 10 minutes on the 3rd, we passed through an area of debris accumulation that kept our fingers moving at impressive speed on the keyboard, trying to keep up and get it all entered. Most of the debris consisted of small scraps of plastic, though a huge partially decomposed tree trunk was impressive enough to lure both us and a sea turtle over for a closer look.

Oceanographic Operations (Candice Hall)

Apart from an incredibly fortuitous trip to Cocos Island on Friday, operations have remained uninterrupted during the last week of Leg 2. Our infallible CTD was champing at the bit and we had the depth to complete both CTD stations that day. Two noteworthy oceanographic occurrences this week have been: 1) a dramatic drop in salinity from 33.21 to 31.70 ppt between 12:00 and 15:00 on 2 September, and 2) an almost total disappearance of the sea surface mixed layer during the last couple of days. The lack of coastal shelf in this region and the freshwater runoff from the land may play an important part in shaping these water properties.

Date	CTD	XBT	Bongo tow	Manta tow
31 Aug	2	3	1	1
1 Sept	2	1	1	1
2 Sept	2	3	1	1
3 Sept	2	3	1	1
4 Sept	In port	In port	In port	In port
5 Sept	In port	In port	In port	In port
6 Sept	In port	In port	In port	In port
Total	8	10	4	4

Turtle Talk (Lindsey Peavey)

Our shortened week was productive for processing turtles. We saw several (all olive ridleys) as we steamed towards Costa Rica, and were able to capture four in between rain squalls. We also saw two large green turtles at Cocos Island. Over the past six weeks we have seen a fair number of copulating olive ridleys. During our inport in Costa Rica, a group of us are going to Playa Ostional, famous for its “arribadas” (arrivals). This is where thousands of olive ridleys nest on the same beach, on the same night. We are visiting during one of the peak months of the nesting season, but during the wrong moon phase. Hopefully we’ll get lucky and I’ll have some special events to report next week. It would be truly amazing to see one of our flipper tags on a nesting female!

Species	Common name	Weekly total	Total-to-date
<i>Caretta caretta</i>	Loggerhead	0	8
<i>Lepidochelys olivacea</i>	Olive ridley	4	44
Grand Total		4	52

Squid Ops - Iliana Ruiz-Cooley

Well... Leg 2 is over. Of course I don't want to leave without reporting the last three days of squid collection. During legs 1 and 2, we have seen how the species composition changes as we move to different latitudes. We observed the range overlap between Humboldt jumbo squid and purpleback squid. In some areas, one is more dominant than the other. During Leg 2, we saw purpleback squid every night, but Humboldt jumbo squid only once! Typically when we see many myctophids at the sea surface, we also see many squid. This is not surprising since myctophids seem to be the main prey item of mesopelagic cephalopods. Squid are fast swimmers and it is very exciting to observe them when they chase and capture their prey! It is like a fast squid dancing. I wonder what their success rate is for catching prey. Honestly, it seems like a squid rodeo when scientists try to catch squid using the dip nets and squid jigs! It is not easy! But, fortunately, we caught many squid (a total of ninety-seven during leg 2, and a whopping fifty-eight in the last three days alone!). I cannot wait to analyze the tissue samples for stable isotopes and to see this tells us about migration and geographic trophic variation. Sailing one month on board the David Starr Jordan has been a wonderful experience. Thanks to everyone for your support and friendship! I'll miss you all! Good luck!

Fish sampled for diet and isotope analysis (for Bob Olson, IATTC)

	Yellowfin Tuna	Skipjack*	Wahoo	Mahi Mahi
Weekly Total	0	0	0	0
Total-to-date	18	9	3	11

*Includes black skipjack