STAR 2000: McARTHUR WEEKLY REPORT
28 September 2000
Sarah L. Mesnick

SCIENCE SUMMARY: 21 - 28 September 2000 (Note that this weekly includes eight days, not the usual seven).

This week, we traversed some 18 degrees of longitude and 6 degrees of latitude as we covered the last bit of trackline of Leg 2, from 3N 103W to 9N 85W, from where our last report comes. Currently, we are steaming our way to Puntarenas, Costa Rica, 81 miles distant. The ITCZ and a tropical wave (a trough of low pressure that produces instability, showers and thunderstorms) dominated our weather for the past several days. Winds blew variably; one moment skies were blue and winds low while the next we dodged rainshowers. We've had a couple of low Beaufort sea state days, several days on that all-too-familiar edge between B5/B6, and one day entirely off-effort due to high winds and drenching rain. By mid-week, the swell changed directions on us and was coming out of the southwest, hitting our port quarter, already high in the water due to our being low on fuel. In contrast to the relatively smooth ride we've enjoyed for the previous weeks (due to the masterful workings of the engineering department and us being heavy with fuel), this week the Mac's roll factor became accentuated. To minimize the impact on all aboard, we began tacking up the trackline by day and traversing south by night. In this manner, we enabled the observers to hold onto their binoculars, gave everyone a night's rest and added trackline miles to compensate for us being somewhat ahead of schedule.

Mirroring the weather, mammal sightings were also variable this week, ranging from 0 - 16, our highest number of sightings per day for the leg. We entered the core area at dawn on 23 September under one of our best weather days; not surprisingly, this was also our 16-sighting day. Sea bird diversity was relatively high (about 18 species/day) but numerical abundance was relatively low. The week was essentially featureless from an oceanographic point of view. Sea surface temperatures increased from the 26°C to 27°C range on 21 September and remained there throughout the rest of the week. As we proceeded eastward toward shore, the thermocline gradually became shallower, from an average of about 60 meters to as shallow as 17 meters on the evening of 26 September. These numbers data do not necessarily come easily. The successful deployment and retrieval of the CTD in less than ideal conditions was accomplished through the coordinated efforts of the bridge, which tries to maintain position amongst high winds, big swell and strong current, and the skilled deck department, thanks to Steve Pierce, Lacey O'Neal, Leroy Jordan and Scott Gage, who twice daily tame an 800lb swinging monster and make it look easy. We were also graced this week with the presence of many mahi on board: 8 each for Leroy and Robert (well, one of Robert's escaped back to the realm of King Neptune), 2 for Mike and Brett, and one each for Thelma and Art; generous pieces of which then later graced our plates.

Striped, common and bottlenose were our most common delphinid sightings. The markedly different swim behavior of the common dolphins, with their bold color pattern and high vaulting leaps, 2 - 3 times body length in height, brought scientists and crew

alike to the bow. On the day we entered the core area, we recorded our first well-developed feeding flocks of the leg. Surprisingly, the first two of these flocks were sighted with Bryde's whales, an association new to both the birder and mammal observers, and were comprised mainly of Arctic Terns. When the whale moved, the birds flew up ahead, clearly very interested in the movement of the whale. Our first landbirds were also recorded that day and our first bowriders showed up on 27 September. The last on-effort sighting of the leg was a giant feeding frenzy of common dolphins and a flock of 400+ birds. Animals were leaping out of the water and plunging into it; an exuberance of life surrounded us in the fading light. The very last sighting of the leg, recorded off-effort as we closed on the common dolphins, was a dispersed group of sperm whales with a cattle egret following us overhead, an odd juxtaposition of land and sea.

Thanks to one and all for a successful and good spirited leg. We are to rest and reprovision in Costa Rica for six days and we await the arrival of our friends on the Jordan. From here we sail south to Peru. Stay tuned.

SIGHTINGS AND EFFORT SUMMARY FOR MARINE MAMMALS: 21 - 28 September 2000

092100 0647 N03:25.99 W103:43.40 131.3nmi 4.5
1343 N03:22.66 W102:35.62

092200 0631 N04:11.25 W100:13.65 104.8nmi 3.6
1828 N04:41.28 W098:14.63

092300 0616 N05:05.70 W096:55.06 76.2nmi 3.5
1802 N05:35.31 W095:19.85

092400 0629 N06:04.12 W094:15.38 66.5nmi 5.1
092500 no effort due to weather
1803 N07:04.68 W092:35.68

092600 0701 N07:21.15 W090:44.21 105.7nmi 5.2
1843 N08:01.45 W088:52.85

092700 0649 N07:16.19 W088:39.61 89.4nmi 4.0
1840 N08:44.93 W087:43.86

092800 0658 N08:21.81 W087:04.07 73.7nmi 5.1
1830 N08:58.12 W085:34.73

Code	Species	Tot#
72	Balaenoptera edeni	3
17	Delphinus delphis	6
36	Globicephala macrorhynchus	1

46	Physeter macrocephalus	1
33	Pseudorca crassidens	2
02	Stenella attenuata (offshore)	2
13	Stenella coeruleoalba	8
18	Tursiops truncatus	8
49	unid. ziphiid	1
61	Ziphius cavirostris	2
77	Unid. dolphin/porpoise	15
79	Unid. large whale	1
98	Unid. whale	1
OTHER		4
TOTAL		55

Common dolphins 1
Spotted/spinner 0
Blue/humback wh. 0
Other delphinids 3
Other cetaceans 1

ACOUSTICS SQUEAKLY REPORT: (Shannon Rankin and Megan Ferguson)

Let me announce possibly the most surprising news of this research project thus far: acoustics has had a slow week. Of six sonobouys deployed, only two were functional. Of these two functioning sonobouys, there were no vocalizations. Of the two acousticians fighting over the monitoring of these two pathetic recordings, neither retains the slightest remnants of her sanity.

Early in the week a (bad) sonobouy was tossed on what turned out to be a mixed sighting of Pseudorca and Globicephala. One of the limitations of acoustics studies is that we cannot (in general) determine who is vocalizing in a mixed species group. Therefore, despite the fact that the vocalizations are often spectacular, recording of mixed species schools is low low low on our priorities. The next day, Saturday, was a fantastic Bryde's whale day. Unfortunately, it was not a fantastic acoustics day. We threw three sonobouys on three different (but very close) sightings, and only one sonobouy was functional. Not a peep was heard. On Sunday, two sonobouys (1 was bad) were deployed on a large group of lethargic Globicephala. Despite our attempts to wake them up with the ship (we came very very close to the group), they did not grace us with any of their vocalizations (they are some of the coolest sounding critters, when they aren't so sleepy). This, my friends, would be a slow acoustics week. On the sunny side of the ETP, by print I will have finished Tolstoy's War and Peace (if I can keep the Evil Doc from his plan to tear out the last chapter) and Megan and I will be enjoying a hearty breakfast of Gallo Pinto y cerveza on terra FIRMA.

BIRD SUMMARY: (Chris Hoefer and Brett Jarrett)

Thirty-five species of seabird were recorded along with a mix of landbird migrants lost (?) at sea. New species for the McArthur's trip list include Black Storm-Petrel, Audubon's Shearwater, Red-billed Tropicbird, Nazca and Brown Boobies, Black Noddy, Royal Tern, and Red-necked Phalarope. Also new was a single Parkinson's Petrel, a species closely associated with pods of pilot whales. However, the low numbers of both species stand in contrast to their relative abundance last year in this same area. All in all, a pretty good week. Though the density of birds wasn't high by any means, the diversity (about 18 species/day) kept the birders from developing that 1000m (oops! I mean 300m) stare. Just kidding Lisa.

Interesting observations include: great looks at Great and Magnificant Frigatebirds in all stages of plumage development, a Henderson's (dark-morph Herald) Petrel, a stunning adult Long-tailed Jaeger, a Blackhawk, and various landbirds. As the Blackhawk sighting news was spread to the inner spaces of the McArthur, it became a nighthawk and then a real Blackhawk. When it was actually just a Blackhawk helicopter giving us a welcoming nod as it flew by at 250 meters. Lisa, we forgot to put this ship follower in the zone. The landbird contingent included some ducks, Wimbrels, a Cattle Egret, a Ruddy Turnstone, Black Phoebe, Prothonotary Warbler, and Bobolinks, Purple Martins and Barn and Bank Swallows.

The last flock of the leg provided a real taste of the enjoyment birders us birders get at sea. All 14 species 400+ individuals involved in this feeding frenzy showed little interest in the ship's close proximity allowing us great looks at their methods and interactions while feeding. One good example of this was a tiny Audubon's Shearwater evasively diving to elude 3 Pomarine Jaeger's from stealing its catch.

In the coming week, the birders would like to see Scarlet Macaw, Boatbilled Heron, Resplendent Quetzal, and spider and capuchin monkeys. Costa Rica - here we come!

TURTLE CAPTURES: (Shannon Rankin)

An adult female olive ridley turtle was entangled in a makeshift buoy with a thin rope tight around the left fore flipper to the bone. The flipper was well into the process of decay. We cut off all the rope that could be accessed without causing damage to what remained. Measured, took blood and tagged the cooperative animal. We released her and she dove immediately.

Species/This week/ Total
Olive Ridley / 1 / 1

DIPPERS REPORT: (James Cotton)

The accounting of the evening dip netting stations (AKA the CTD station) has been conspicuously absent from the weekly reports and not without good reason, so have the

flying fish, our primary target. The number and diversity of flying fish outside of the core study area were low compared to a similar sampling scheme last year. With few exceptions the collection of the four winged flying fish (Cypselurus, Hirundichthys and Cheilopogon) were confined to 12 of the 42 stations. Thanks to Isabel's early morning dipping efforts four additional specimens are now sleeping in the freezer. Perhaps the most interesting specimen collected, the spot winged flying fish (C.atrisignis), voluntarily flew on board while we were underway at night, a bad career move for any fish when Bret Puckett or Robert Rowe are prowling the decks before sunrise in hopes of winning the coveted flying fish award.

We fared only slightly better in collecting the two winged variety of flying fish (Exocetus). They showed up at 23 of the 42 stations and were also present in small numbers this season. The short winged flying fish (Oxyporamphus), not really a flying fish but often seen and included in the collection, were observed at about half of the stations and were represented in relatively few numbers as well. As was expected the lantern fish (Myctophid sp.) were the most frequently seen and collected fish, making their appearance at all but four stations. Their numbers were more on par with our expectations. Since crossing into the core area at 5N and 98W we have seen a dramatic increase in the number and diversity of fish at the evening stations. Dipping in beau.5 and rainy conditions were the standard during our transit through the convergence zone but our spirits, knowing that better dipping days are ahead of us.

Common name	outside area	core area
	(42 stations)	(7 stations)
	no. collected	no. collected
four winged flying fish	21	15
two winged flying fish	85	28
short winged flying fish	59	41
lantern fish	427	35

BIOPSY SUMMARY: (Ernesto Vazquez)

Species	Number of Samples	Cumulative Total
Balaenoptera edeni	0	1
Globicephala macorhynchus	0	7
Stenella attenuata subsp.	0	1
Tursiops truncatus	0	3
Grand Total		12

35mm PHOTO SUMMARY: (Annie Douglas)

Species	Number of Schools/Individuals	Cumulative Total
Stenella attenuata	0	6
Stenella longirostris (SW)	0	7
Stenella coeruleoalba	1	2
Tursiops truncatus	0	2
Grampus griseus	0	1
Globicephala macrorhynchus	0	3
Globicephala sp.	1	1
Indopacetus pacificus	0	1
Orcinus orca	0	2
Pseudorca crassidens	1	2
Delphinus delphis	2	2
Balaenoptera edeni	1	3
Grand Total	6	32

OCEANOGRAPHIC SUMMARY: (Pierre Malan)

The last week of the cruise was essentially featureless from an oceanographic point of view. The water temperature was stable in the 27°C range, increasing slightly as we approached the coast. Salinity values were comparatively low, mainly in the 33% range. The thermoclines tended to become shallower as we neared the coast.

Plankton samples were larger and some contained large number of crab megalopa and juvenile fish. The increase in available food could explain the rather better catches of flying fish by the dipnetters. The fishermen were also more successful.

The weather was generally quite rough, resulting in some marginal CTD retrievals. One station was abandoned due to the difficulty of deploying the CTD. Fortunately there was no damage to personnel or equipment, although pulse rates soared on occasion.

Operation	This Week	Total
CTDs	15	98
XBTs	21	166
Manta Tows	7	49
Ring Net Tows	7	24
Bongo Tows	8	50