

**STAR 2006: NOAA Ship *McArthur II*
Weekly Science Report**

*Jay Barlow, Cruise Leader
02 November 2006*

Science Summary: 26 October – 02 November, 2006

Today is our last day of research at the end of a very successful Leg 3. We arrive in Manzanillo, Mexico tomorrow morning for a period of renewal. As usual, the scientists will scatter to the winds for rest and relaxation, while most of the crew and officers will be working hard to ensure that the ship will be ready to leave again next week. We express our gratitude to those hard-working individuals on the *McArthur II* who make our science possible. This week has been an especially challenging one... we had two casualties. On Saturday morning, the electrical conducting cable that supports our CTD parted and this expensive piece of equipment fell to the seafloor. The CTD (Conductivity, Temperature and Depth Sensor) is a complex system of oceanographic sensors, water sampling bottles, and electronic triggers that closes the bottles on command. It is rare to lose one of these, but this reinforces a lesson I was taught in basic oceanographic classes many years ago... "if you can't afford to lose something, then don't put it in the water". This particular CTD system belongs to the ship, and the Pacific Marine Center has already shipped replacement parts to Manzanillo. Fortunately, our resourceful oceanographers (Mindy Kelly and Lacey O'Neal) have patched together a CTD replacement system using a SEACAT autonomously recording device and the deck crew has stripped off any wire that might have hidden flaws. We were soon back in the water sampling salinity and temperature to 1000 meters. The other casualty occurred yesterday when the huge electric motor for one of the engine room cooling fans burned out. A new one of these is also being shipped from Seattle to Manzanillo. We have faith that our resourceful engineers will have it up and running in no time.

Oceanographically, this week we have passed from cool equatorial waters into the pool of warm water that constitutes the "core" area for spotted and spinner dolphins. We had a couple of days that kept us very busy chasing down sightings almost as soon as we returned to effort. However, these species seem to be especially patchy in distribution this week.

Halloween was celebrated at sea with much gusto this year including a costume party, pumpkin cookies, and a Frankenstein movie. Many thanks go to those on the shore (you know who you are) who sent out candy, decorations, and costume material! And thanks to Mindy, our interior decorator and pumpkin princess. Congratulations David H. (aka Horror Hermie) for winning the costume contest (Jim Cotton came in a close second, but he was just wearing his usual clothes).

The end of a Leg means that we need to say goodbye to some departing friends. Danna Shulman and Kruger Loor, our visiting scientist and foreign observer, have been delightful to sail with. In addition to her own squid work, Danna was always there helping with oceanographic operations. Kruger was equally devoted to helping in all

things oceanographic and did prodigious duty as an independent observer on the flying bridge. Pat Patana, our augmenting Executive Officer has been great to work with, as always. We wish we could keep him! We will sorely miss all who are leaving. Next Leg will also bring a new cruise leader (they are returning me to my cage), so this is my time to say goodbye. It's been a real pleasure sailing with such a crew of talented professionals. I will miss them all.

Sightings and Effort Summary for Marine Mammals

DATE	Start Stop Time	Position	Total Distance	Average Beaufort
102606	0648 1854	N01:39.14 W106:30.25 N01:53.51 W108:01.87	89.2 nmi	4.2
102706	0659 1730	N02:32.91 W109:19.49 N03:18.05 W110:44.02	88.0 nmi	4.8
102806	0713 1858	N03:57.97 W112:00.85 N04:50.53 W113:34.72	72.7 nmi	4.3
102906	0719 1856	N06:27.29 W113:03.73 N08:02.78 W112:02.83	86.5 nmi	4.1
103006	0715 1835	N09:23.14 W111:08.38 N10:45.91 W110:14.59	75.4 nmi	2.8
103106	0710 1839	N11:57.46 W109:26.16 N13:18.50 W108:34.15	67.2 nmi	3.5
110106	0706 1829	N14:36.34 W107:40.70 N15:58.07 W106:45.15	94.5 nmi	4.1
110206	0701 1820	N17:08.12 W105:57.98 N18:35.43 W104:57.66	101.0 nmi	3.0

CODE	SPECIES	TOT#
CODE	SPECIES	TOT#
002	<i>Stenella attenuata</i> (offshore)	8
003	<i>Stenella longirostris</i> (unid. subsp.)	2
010	<i>Stenella longirostris orientalis</i>	5
011	<i>Stenella longirostris</i> (whitebelly)	1
013	<i>Stenella coeruleoalba</i>	1
015	<i>Steno bredanensis</i>	1
017	<i>Delphinus delphis</i>	2
032	<i>Feresa attenuata</i>	1
033	<i>Pseudorca crassidens</i>	1
036	<i>Globicephala macrorhynchus</i>	4
037	<i>Orcinus orca</i>	1
046	<i>Physeter macrocephalus</i>	1
049	ziphiid whale	2
051	<i>Mesoplodon sp.</i>	2
072	<i>Balaenoptera edeni</i>	1
079	unid. large whale	1
101	<i>Stenella longirostris</i> (southwestern)	4

CODE	SPECIES	TOT#
177	unid. small delphinid	2
377	unid. large delphinid	1
TOTAL		41

Biopsies (Suzanne Yin and Erin LaBrecque)

Species	Common Name	Weekly		Total	
		Samples	Takes	Samples	Takes
<i>Balaenoptera edeni</i>	Bryde's whale			1	1
<i>Balaenoptera musculus</i>	Blue whale			9	10
<i>Delphinus delphis</i>	Short-beaked common dolphin			2	3
<i>G. macrorhyncus</i>	Short-finned pilot whale			18	21
<i>Pseudorca crassidens</i>	False killer whale			3	5
<i>Stenella attenuata</i>	Pantropical spotted dolphin			1	1
<i>Tursiops truncatus</i>	Bottlenose dolphin			23	46
Total		0	0	57	87

Photo-id Report (Isabel Beasley and Jim Cotton)

We lost our blue whales this week (much to our dismay) and instead photographed a number of small delphinid species, mainly spotted and spinner dolphins.

We finished off Leg 3 with our first group of spotted dolphins that actually came over to bow-ride. In this group was a 'showy' individual with intriguing white pigmentation over most of its upper body. Thanks to this unusual looking show-off, we were able to get some of our best spotter pictures of the cruise so far.

Species Code	Species	This week	Total
002	<i>Stenella attenuata</i> (offshore)	2	4
003	<i>Stenella longirostris</i> (unid. subsp.)	1	1
010	<i>Stenella longirostris orientalis</i>	1	1
011	<i>Stenella longirostris</i> (whitebelly)		6
101	<i>Stenella longirostris</i> (southwestern)	1	4
013	<i>Stenella coeruleoalba</i>		13
015	<i>Steno bredanensis</i>		1
017	<i>Delphinus delphis</i>	2	12
018	<i>Tursiops truncatus</i>		13
021	<i>Grampus griseus</i>		1
026	<i>Lagenodelphis hosei</i>		2
031	<i>Peponocephala electra</i>		1
033	<i>Pseudorca crassidens</i>	1	6*
036	<i>Globicephala macrorhynchus</i>	2	29*
037	<i>Orcinus orca</i>		4*
046	<i>Physeter macrocephalus</i>	1	4

Species Code	Species	This week	Total
072	<i>Balaenoptera edeni</i>	1	9*
075	<i>Balaenoptera musculus</i>		17*
076	<i>Megaptera novaeangliae</i>		1
TOTAL		12	130

* Individual whales photographed

Seabird and Marine Debris (Michael Force and Sophie Webb)

Garbage and boobies highlight our first full week in the ETP core study area. We found many feeding flocks over spotted and spinner dolphins, primarily Brown, Masked, and Red-footed Boobies, with varying proportions of Juan Fernandez Petrels and Wedge-tailed Shearwaters. Also present in most flocks were lesser numbers of Sooty Terns, storm-petrels and jaegers. Juan Fernandez Petrels were most abundant along the southwestern portion of our surveyed trackline but eventually dropped out of the mix as we steamed northeastward. In addition to plenty of Juans, we also enjoyed high species diversity early in the week, perhaps residual effects of the North Equatorial Countercurrent. We found our only Black-winged and Murphy's Petrels in this area, the latter species slightly farther east than expected. The number of species seen this week matched the previous record of 28; both weeks were also very similar in species composition, although our daily average this week dropped from 14 to 12. We endured several apparently bird-free days, or at least that was our impression, yet by the end of the day we had seen a high number of species thanks to the diverse feeding assemblages associating with dolphins and/or fish. Highlights include our first Laughing Gull, several unidentified "peeps", likely Western Sandpipers, an unidentified *Dendroica* warbler and our first Sooty Shearwater since 11 September.

As we approached Manzanillo, bird diversity dropped, while the increase in the amount of trash was staggering. We expected this, but it was still jarring to the senses, considering how little we've seen the past couple of months. Bottles of every size and description, styrofoam, assorted fishing debris, a sandal (without a foot attached), undecipherable bits of bric-a-brac of the sort one may find underneath the sofa cushions, it's all there. Many areas of the developing world are suffocating under plastic bottles. The erosional effects of thunderstorm-induced debris torrents flush the ravines and gullies, where much of the garbage is dumped, out to sea. The coastal influence was evident, marked both by junk and subtle changes in seabird species. On the final day, we found our first Black and Least Terns of the cruise, frequently taking advantage of the myriad perches from which to chose (a styrofoam slab one day, a 55 gallon drum the next).

Oceanographic Operations (Melinda Kelley)

Date Range	Day	CTD	SeaCat	XBT	Bongo	Manta
Leg 3	Thursday	2	0	3	1	1
	Friday	2	0	3	1	1
	Saturday	2	0	3	1	1
<u>10/25</u>	Sunday	1*	0	4	1	1
to	Monday	0	1	5	1	1
<u>11/03</u>	Tuesday	0	2	3	1	1
	Wednesday	0	2	3	1	1

Date Range	Day	CTD	SeaCat	XBT	Bongo	Manta
	Thursday	0	2	3	1	1
	Totals	7	7	27	8	8

*Relocation of the CTD package

This week the oceanographic team decided to relocate the CTD package to 3° 56.9'N and 111° 59.2'W. Some may say we lost the package, but we like to look at the situation in a positive manner. We know where the CTD is located; is it really lost or just misplaced? Regardless, for the remainder of leg 3 we have managed to continue collecting water column profiles, thanks to a Sea-Bird Electronics SeaCat profiler. This alternate instrument has allowed us to record the same water column variables (conductivity, temperature and depth), just at a lower resolution. While we have maintained water column profiles, we have not been able to collect chlorophyll samples below the sea surface. This is a great loss for the oceanography group. Sea surface chlorophyll samples have been taken at SeaCat stations in attempt to maintain some continuity in the chlorophyll data.

The loss of our CTD was caused by a break in the conducting cable of the winch, which may have been due to age, use and/or corrosion. We look forward to receiving a new CTD system in Manzanillo, thanks to the ongoing efforts of many individuals. I would like to thank everyone both on and off the ship; their efforts to ameliorate a rather overwhelming situation have been amazing.

This week anyone observing sea surface temperatures would have noted a remarkable rise. Early in the week temperatures averaged 26 degrees Celsius. As we moved through the week, the temperature slowly climbed to a max of 30 degrees Celsius. As the sea surface temperatures were rising, the evening stations seemed to heat up. With Halloween night operations taking place just after our costume party, the fantail was the place to see it all. "Retro" dip netter, "pixie jiggin" squid kid and a "sea kitten" could be found doing their thing. We had a great laugh as we watched Lacey deploy our tiny profiler (SeaCat) from an oversized fantail and A-frame, while sporting a tutu, red rosy cheeks and a fuzzy tiara atop his hard hat. It was a graceful and surreal deployment.

Net tow sample sizes have not been impressive this week. Our last manta tow delivered us a cod end full of driftwood and miscellaneous items. Throughout the week, Danna has continued to assist with fixing samples as well as sorting the port cod end each evening. Kruger has continued with his support in deployment and retrieval of both the Manta and Bongo frames. Thank you to both Danna and Kruger for all your support, patience and efforts; you are appreciated more than you know. It was wonderful sailing with you!

Squid Report - Danna Shulman

Perhaps it's the influence of the waxing moon, but squid catches have been limited. Wednesday night was our first squid on deck since October 24th. At most stations we saw a few at the surface, but not in great numbers, and they were uninterested in our lures. To

the surprise of all, my sonobuoy parachute costume did nothing to attract squid on Halloween! Finally, on Wednesday night, Luke jigged three squid (two *Dosidicus* and one *Stenoteuthis*), so at last I have squid ink under my nails again. On Thursday the dip netters took over the squid front, bringing one juvenile on board in the morning, and two *Stenoteuthis* and one juvenile in the evening.

Bongo tows have been a somewhat more reliable source of squid, with anywhere from two to ten squid paralarvae every evening. On Thursday night, I sorted a very respectable twenty (20) squid from the bongo cod end, a good end what has been a very successful trip.

I'm truly sorry to be leaving such a wonderful research environment. Everyone's been welcoming and generous beyond anything I could have hoped for. Thank you, scientists and crew of the *McArthur II*!

Squeakly Report (Shannon Rankin and Liz Zele)

This week in acoustics was brought to you by your local chocolate covered coffee bean. Are you having troubles juggling three simultaneous acoustics detections, managing recordings, filtering radio chatter while ship noise is blaring in your ears? Is your metabolism at an all-time low due to the arctic conditions in which you work? Looks like you need a magic bean (or five or six or seven).

We had another insane week for acoustics, with a total of 96 acoustic detections, including an obscene 20 detections in a single day. Of the 73 non-sighted detections, one was a sperm whale in which we led an acoustics chase (always a crowd-pleaser). This whale's performance underwater was exceedingly cooperative; however, he changed his tune once the observers got their eye (and crosshairs) on him. We also hit the jackpot of diversity, with recordings from all of our favorites (including seven groups of spinner dolphins!). A magnificent silence was bestowed upon us by a few beaked whales and a group of killer whales.

Always the overachievers (whether we like it or not), we took advantage of our single quiet morning to perform a localization experiment. This consisted of disturbing the peace by blaring a synthesized whistle from an underwater speaker hung from the small boat. As the *McArthur* passed the speaker, one lucky acoustician sat in the lab, frantically localizing the tweet tweet tweet. The experiment was successful, and we have already completed a manuscript rating 9 out of 10 on the dull scale. Better than a sleeping pill.

Next time you see your local acoustician wandering down the hall with a glazed look on her eyes, do the kind thing, and pop a chocolate covered coffee bean into her mouth.

Dippers' Doldrums (Jim Cotton)

Few flyingfish were seen during the evening stations this week and even fewer made it to the freezer. What has been seen for most of the week was the moon. While pleasant to look at, it's presence makes dipping difficult as our victims see us before we see them beneath the lights, at least that's the excuse we dippers like to use for not catching many fish.

With the exception of one moonless night, when we captured eight specimens, our efforts netted an average of less than two fliers a night even though tens of thousands were seen during one day's vigil from the flying bridge.

“Weakly” Totals:

9-Four wined flyingfish
14-Two winged flyingfish
23-Shortwinged flyingfish
26-Lantern fish

Fish Sampled for Diet and Isotope Analysis

Species	Samples	
	Weekly	Total
Mahi mahi	-	3
Wahoo	-	1