

STAR-LITE 2007: NOAA Ship *David Starr Jordan*
Weekly Science Report

Lisa T. Ballance, Cruise Leader
21 October 2007

Science Summary: 14-20 October 2007

The goal of each leg of our project is to survey the same two diamond patterns; each of 4 lines per diamond is to be completed twice, in sequence, the first line in passing and the second line in closing mode, with each line requiring one day to complete. We have two weather days built into each leg, so in the case of rain or wind, we can sit the day out and still be able to complete our two diamond patterns. The close of this week finds us well into our operational number of days for Leg 3 (almost half-way through, in fact). So far we have managed to complete two of our eight planned pairs of transect lines and we have burned both weather days. STAR-LITE is going through a mid-cruise crisis.

Kiko has been queen this week. “Tropical Depression 15E” appeared on the Navy’s radar screen during our e-mail outage last weekend. By Monday, it was on **our** radar screen as well, evidenced by the weather maps coming in and the Beaufort 5 and 9-foot seas all around us. Although it was merely 100 nautical miles to our northwest, it was not a bad system and we expected it to develop and move along to the northwest (conveniently away from us) like all such systems out here. It was not to be. Rather than moving, she stalled, grew in strength (thus receiving a name), and then moved to the east and slightly south, perched right in between our two diamonds. Monday’s official forecast: “A NEARLY STATIONARY CYCLONE FOR THE NEXT FIVE DAYS.” Consequently, we failed to complete our closing day on Monday (T2) due to bad weather and left Diamond 1 altogether in an attempt to get away from the storm. Tuesday, T5 was completed in passing mode and Beaufort 6 but we couldn’t get back to our start point for the next morning because of the 30 knots of wind and 12-foot seas against us, so we gave up altogether and just took the course of least resistance to the south on Wednesday (who cared where the survey lines were by that point?). In the meantime 35 knots of wind mid-day nearly took the flying bridge canopy away into the great blue yonder (and **did** take a fishbox lid) were it not for Brad, Dave, Jake, Mike and a host of scientists armed with lines tied to anything “secure” [see photo section below]. Still valiantly trying, we began Thursday (T6) in passing mode but Beaufort 6 shut us down mid-day. We finally managed to eke out a complete survey day on Friday (T6 in passing mode, again) without the acoustic array for fear the seas would jerk it apart.

In the midst of this was an insidious little icky sickness that gradually made itself apparent through the sudden disappearance of various persons, whose doors stayed shut for 24-36 hours followed by their reappearance as if from a near-death experience. It started on Day One of the leg and each day dropped one or two additional victims as the previous ones recovered. Those on the Main Deck were the first to fall but the disease worked its way up the hall, climbed to the 01 Deck, dropped more victims, and finally reached the 02 Deck as we were experiencing the worst of the storm. Our medical officer gave up holding regular office hours and instead, sat with her computer in the medical room from morning to night, ready to assist the latest recipient. Yours truly was the last to go and by Friday, 20 of our 34 persons aboard (score 59% for the icky sickness) had partially to fully recovered. (Epilogue from Jane: “Likely viral gastroenteritis,

based on symptoms and epidemiology, passed by person-to-person contact or contaminated surfaces. Hero of the week: Annette who made it her business to fill in for each sick scientist as they dropped in sequence.)

As if this were not enough, our water evaporators decided to act up and at the beginning of the week, water rationing was officially declared. Laundry was secured, Navy showers were in effect, and we ate off paper and with plastic while our Chief Engineer and his team slaved away in the boiling engine room. The CTD insisted on inserting massive spikes into the data traces despite the best efforts of our Survey and Electronics Technicians and oceanographers. What's next?

And then Saturday came. The sky showed blue; the Beaufort dropped to a four; we saw dolphins and deployed nets; we ate real food on porcelain and with silver (look-alikes); we did laundry; the CTD signal was clean. Life began anew. Next week – perhaps some science news.

Post Script: Congratulations to Dave Hermanson for his promotion to Boatswain Group Leader! Party on the first night of the next inport! (We sure need it.)

Transect Effort

Date	Start/ Stop Time	Position	Total nm	Average Beaufort	Mode of Operations
101407	857	N16:06.02 W106:14.96	84.7	4.2	Closing
	1935	N14:43.93 W107:09.89			
101507	913	N14:49.91 W107:05.82	26.3	5.7	Passing
	1201	N14:27.80 W106:51.11			
101607	856	N13:43.88 W105:20.95	88.1	5.3	Passing
	1855	N12:27.99 W104:29.94			
101707	----- No effort due to inclement weather -----				
101807	925	N12:29.41 W104:29.17	39.6	5.6	Passing
	1400	N13:02.60 W104:06.97			
101907	908	N12:28.81 W104:29.37	95.2	5.0	Passing
	1900	N13:54.58 W103:31.65			
102007	1005	N12:28.11 W104:29.89	68.8	4.0	Closing

Marine mammals (Richard Rowlett, Juan Carlos Salinas, Suzanne Yin, Ernesto Vázquez, Adam Ü, and Robert L. Pitman)

Code	Species	Number of Sightings
002	<i>Stenella attenuata</i> (offshore)	9
010	<i>Stenella longirostris orientalis</i>	6
013	<i>Stenella coeruleoalba</i>	2
018	<i>Tursiops truncatus</i>	1
051	<i>Mesoplodon</i> sp.	2
077	Unid. dolphin	1

Code	Species	Number of Sightings
177	Unid. small delphinid	5
Total		26

Plots at the end of this report depict locations of small delphinid sightings.

Photography (Adam Ü and Nick Kellar)

Between the fairly horrible weather, the little stomach bug that was going around, and the lack of sightings to photograph, Yours Truly was experiencing a new level of “Tropical Depression.” The past week has been the slowest on the photography front yet, with only one group of spotted dolphins coming within range for approximately 30 seconds, allowing a whopping 10 frames to be taken before they skeddaddled away. Luckily there were other things to photo-document, including the Hurricane Kiko-induced near-death of our flying bridge canopy (the repair of which has provided the flying bridge regulars a new ropes course to navigate) and a visiting Peregrine Falcon with a taste for storm-petrels.



Flying bridge canopy secured by multiple lines due to Hurricane Kiko. Photo: Adam Ü.

Species	Common Name	Weekly photographs		Total photographs	
		Individual	Schools	Individual	Schools
<i>Stenella attenuata</i>	Pantropical spotted	1	10	11	236
<i>Stenella longirostris</i>	Eastern spinner dolphin	0	0	2	38
<i>Stenella coeruleoalba</i>	Striped dolphin	0	0	2	20
<i>Tursiops truncatus</i>	Bottlenose dolphin	0	0	2	74
<i>Grampus griseus</i>	Risso's dolphin	0	0	1	42
<i>Feresa attenuata</i>	Pygmy killer whale	0	0	5	304
Total		1	10	23	714

Biopsy (Juan Carlos Salinas, Ernesto Vásquez, and Suzanne Yin)

Species	Common Name	Weekly		Total	
		Samples	Takes	Samples	Takes
<i>Pseudorca crassidens</i>	False killer whale			1	4
<i>Stenella attenuata</i>	Pantropical spotted dolphin			2	10
<i>Tursiops truncatus</i>	Bottlenose dolphin			2	8
Total		0	0	5	22

Squeakly Report (Megan Ferguson with assistance from Suzanne Yin and Sophie Webb)

The acoustics program continued to operate with a skeleton crew this past week, with the computers recording but nobody listening. Due to rough seas, we deployed the array on only two days. Everything appears to be functioning as it should. We're hopeful that the ghouls and goblins have prior obligations with Halloween approaching and we'll make it through the Leg without incident.

Seabirds (Michael Force and Sophie Webb)

We could blame Tropical Storm Kiko for the poor avian showing this week, but we won't. It is, after all, a patchy environment out here and birds will follow their food supply. Using diversity as an indicator, our daily species tally can range from five to sixteen species, with the average around 12 to 14. Similarly, each week reveals 22 to 23 species, this also being very consistent throughout the cruise, with an eight week average of 22 species. So even though we felt it was a little slow this week, we still managed to find the expected 22 species.

The latter half of this week was notable for reduced abundance of species previously very common whereas others, particularly boreal migrants, increased. In the former category are Wedge-tailed Shearwaters, in the latter, jaegers and Leach's Storm-Petrels. Wedge-tailed Shearwater, along with Juan Fernandez Petrel, was the most abundant seabird in August and September, particularly in feeding flocks over fish and/or dolphins; hundreds or thousands were easily tallied each day. Lately, however, it has practically disappeared as they return to their nesting islands in far-flung reaches of the tropical Pacific Ocean. On some days, Leach's Storm-Petrels outnumbered Wedge-tailed Shearwaters, a situation we wouldn't have thought possible a couple of months ago.

After Tropical Storm Kiko and the *McArthur II* parted ways, a juvenile male Peregrine Falcon showed up. His three day stay helped to reduce the burgeoning numbers of Leach's Storm-Petrels in the surrounding seas. At their nesting colonies, Leach's Storm-Petrels are nocturnal, a successful strategy to avoid predation. In the pelagic environment, predation pressure is practically non-existent other than the occasional skua and jaeger; they are ill-adapted to deal with a hungry and efficient predator like a Peregrine Falcon. Whenever it was time to fetch a meal, he would leap off the aft mast and, with remarkable speed, close in on a Leach's Storm-Petrel that was well beyond our range of vision. The stormy didn't stand a chance. The falcon would return to his perch, whereupon a rain of storm-petrel feathers indicated a contented falcon was enjoying his easy catch. One day tally: 5 storm-petrels caught, probably all Leach's, and one missed. It's like shooting fish in a barrel. Around midday of his third day on board, he was last seen, with a dead storm-petrel firmly in his grasp, flying towards a nearby Del Monte cargo ship on its way to Venezuela (photo by Sophie Webb). Why fly south when one can simply enjoy the creature comforts of a southbound ship and get fat on Leach's Storm-Petrels?



Peregrine falcon with Leach's Storm-Petrel clasped in his talons. Photo: Sophie Webb.

Plots at the end of this report depict location of seabird flocks.

Oceanography (Candice Hall and Ryan Driscoll with assistance from Megan Ferguson, Annette Henry, and Nick Kellar)

Tropical Storm Kiko dominated our last week, impacting operations across the board. She was impressive with 20 – 30 knot winds, gusting up to 35 knots, while the ~13 foot sea swells came from multiple directions. Her presence was noticeable in our data as, at 27.09 °C, we recorded the lowest sea surface temperatures yet this cruise. However, our average sea surface temperature remains at a steady 28.46 °C with a sea surface salinity of 33.36 psu.

Another impact of Tropical Storm Kiko has been a very uniform mixed layer. Stronger winds create increased wave action causing more turbulent mixing of the surface water layers. This has a beneficial effect in that it helps to disperse nutrients and oxygen, the basis of any food chain, throughout the mixed layer.

Date	CTD	XBT	Surface Chlorophylls	Bongo tow	Manta tow
101407	2	4	4	1	1
101507	3	4	4	1	1
101607	2	4	4	1	1
101707	0*	0*	0*	0*	0*
101807	1	2	2	0*	0*
101907	2	4	4	1	1
102007	2	4	4	1	1
Total	12	22	22	5	5

*Sampling not possible due to weather.

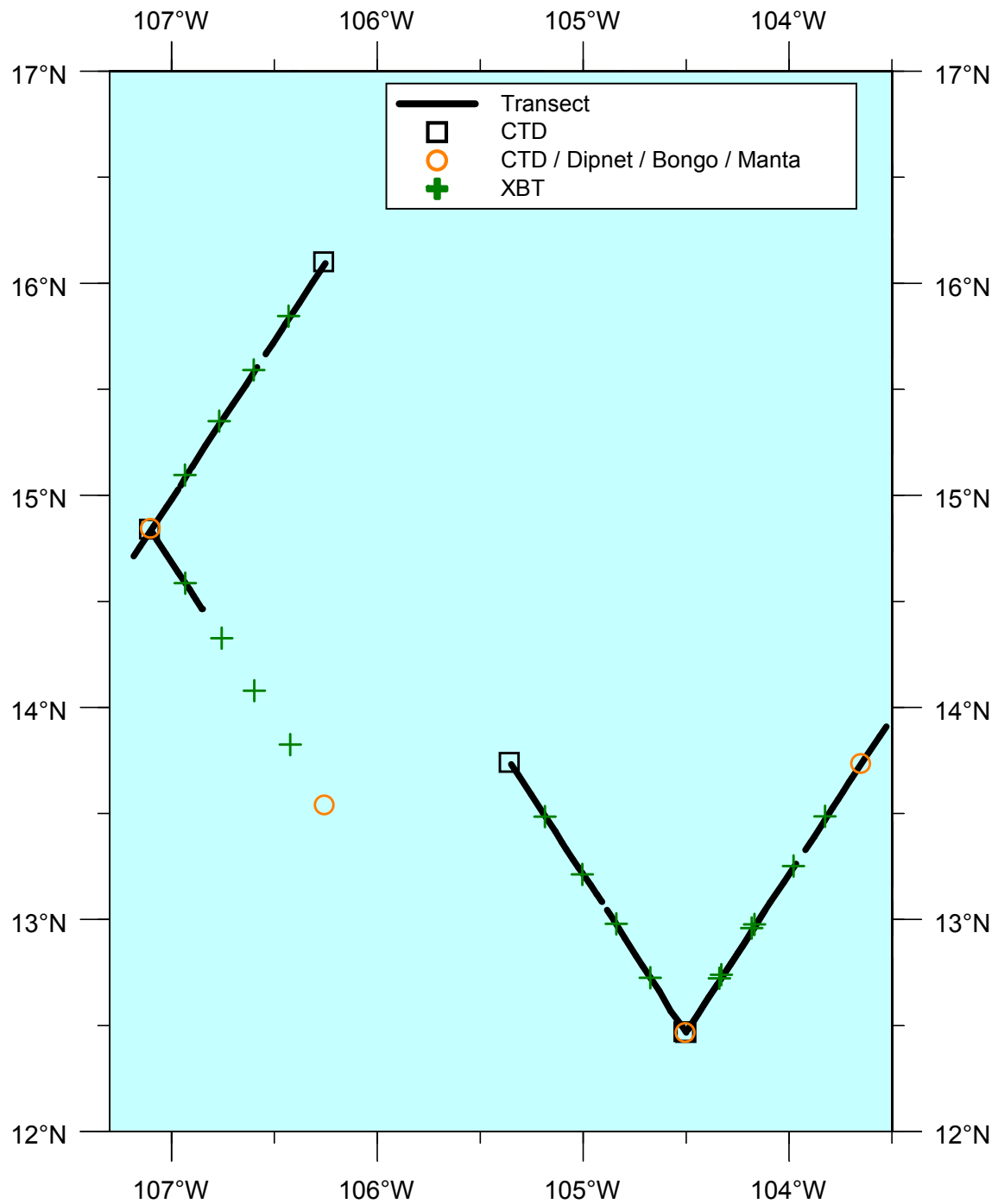
Dipnet Report (Juan Carlos Salinas, Ernesto Vázquez, Adam Ü, Ryan Driscoll, and Robert L. Pitman)

This week was not very productive for the dippers with only 35 flyingfish collected and 23 stomach samples preserved. During this week the storm “Kiko” left us with strong winds and high swells which made the fishing quite challenging; we are hoping to report better numbers next week. Stay tuned.

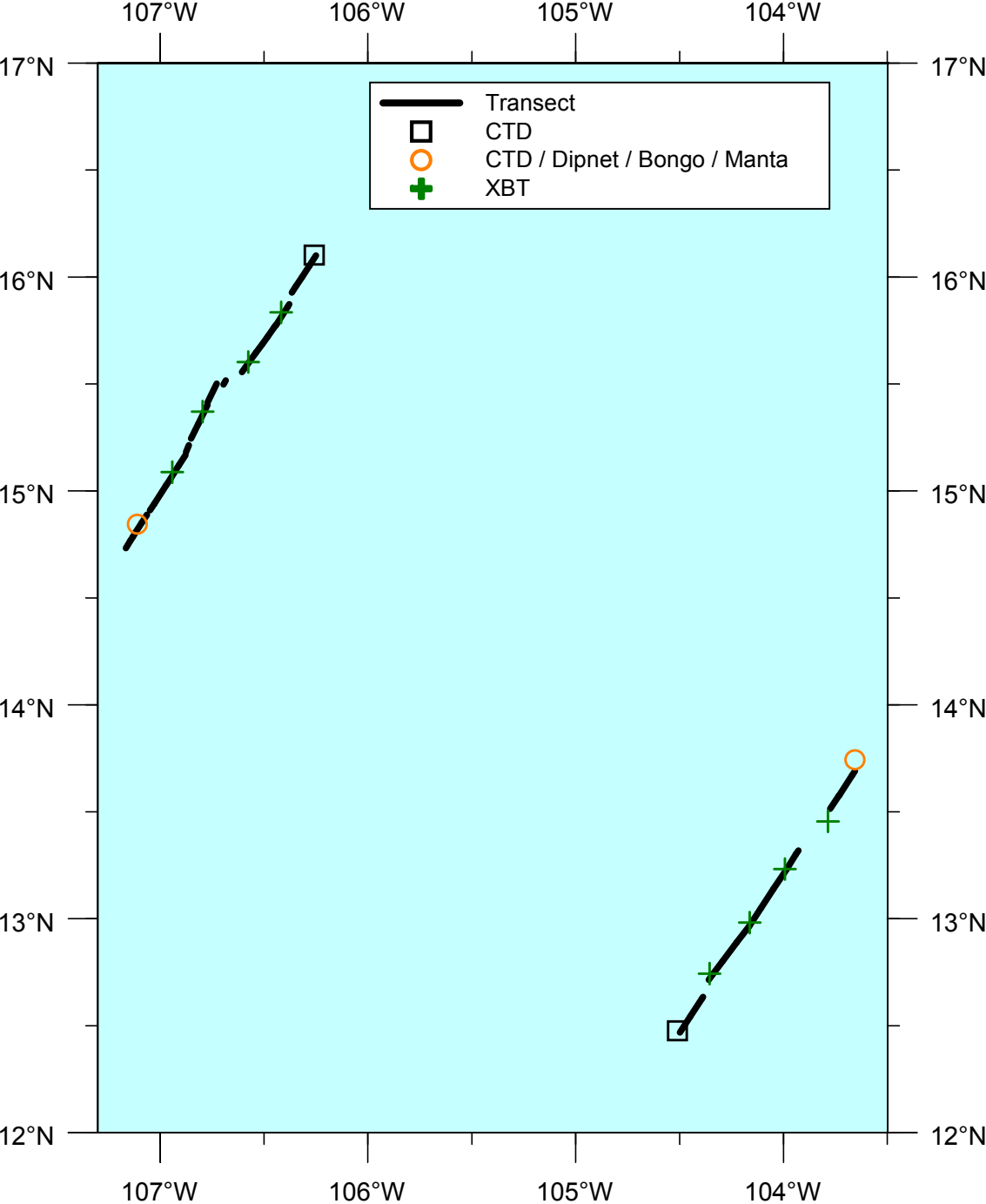
Fish collected	Weekly total	Grand total
Two-winged flyingfish (<i>Exocoetus</i> sp.)	14	176
Four-winged flyingfish (<i>Cheilopogon</i> , <i>Hirundichthys</i> , <i>Prognichthys</i>)	16	104
Short-winged flyingfish (<i>Oxyporhamphus</i>)	4	81
Lantern fish (Myctophidae)	1	8
Unidentified fish	0	3
Total	35	372

Stomach samples collected	Weekly total	Grand total
Two-winged flyingfish (<i>Exocoetus</i> sp.)	123	121
Four-winged flyingfish (<i>Cheilopogon</i> , <i>Hirundichthys</i> , <i>Prognichthys</i>)	68	68
Short-winged flyingfish (<i>Oxyporhamphus</i>)	9	4
Total	201	197

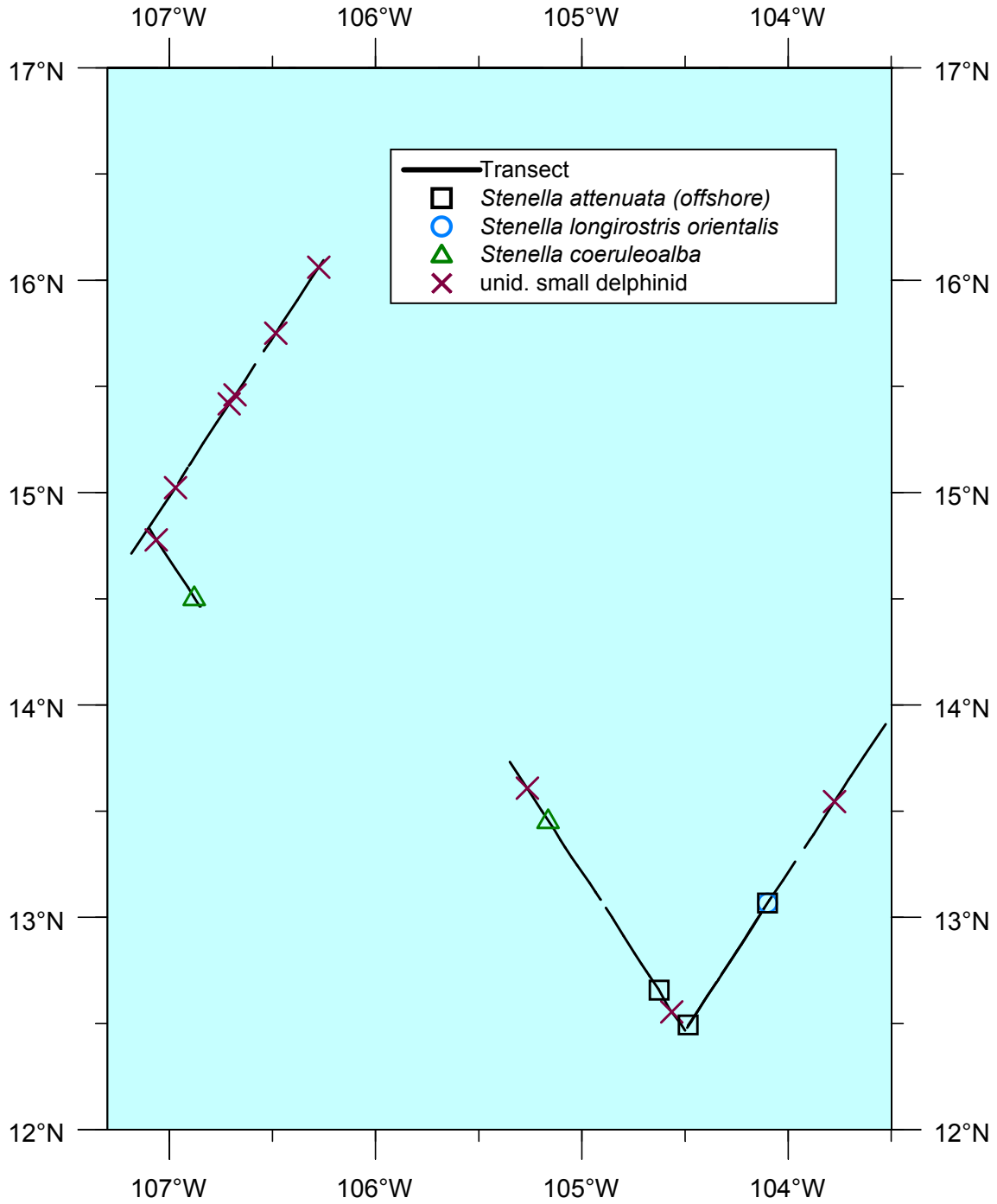
Ecosystem Sampling Stations, Leg 3; Passing Mode



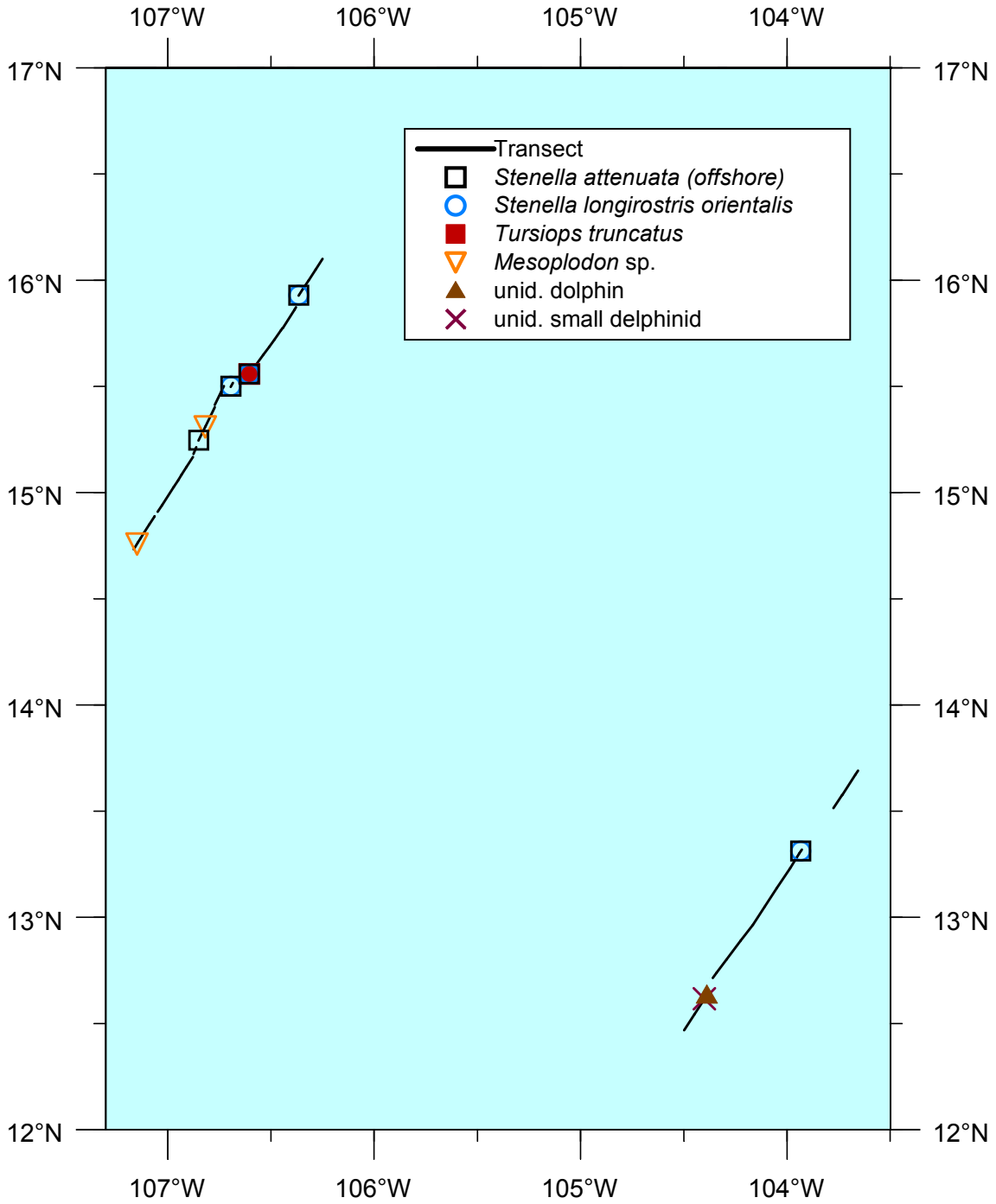
Ecosystem Sampling Stations, Leg 3; Closing Mode



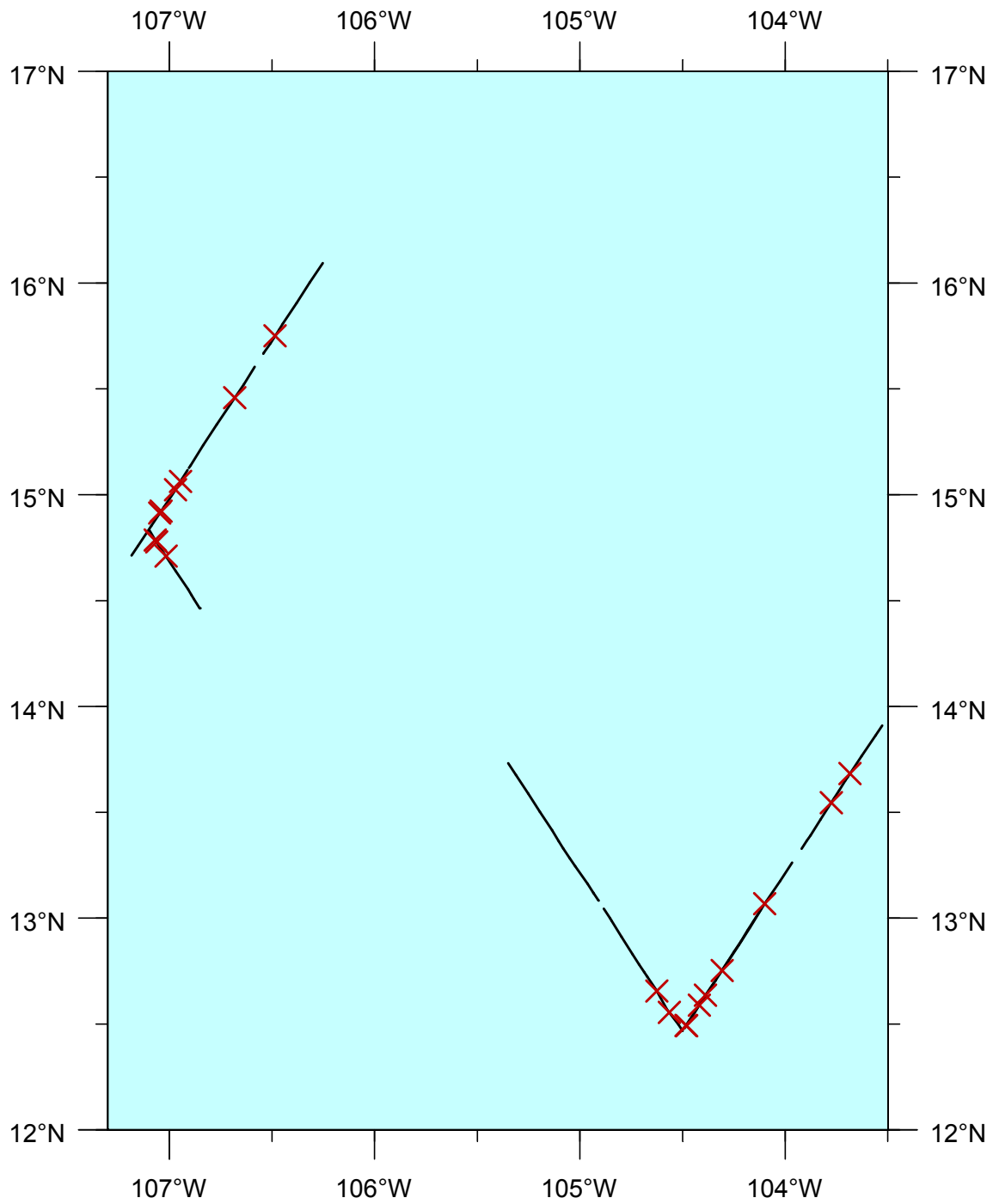
Cetacean Sightings, Leg 3; Passing Mode



Cetacean Sightings, Leg 3; Closing Mode



Seabird Flocks, Leg 3; Passing Mode



Seabird Flocks, Leg 3; Closing Mode

