

Marianas Cetacean Surveys 2013: Guam, Rota, Saipan, Tinian and Aguijan (19 June – 31 July)¹

Marie Hill^{1,2}, Allan Ligon³, Adam Ü⁴, Mark Deakos³, and Erin Oleson²

¹ Joint Institute for Marine and Atmospheric Research,
Research Corporation of the University of Hawai'i,
1000 Pope Road
Honolulu, Hawai'i 96822, U.S.A.

² Pacific Islands Fisheries Science Center,
1601 Kapi'olani Boulevard, Suite 1000,
Honolulu, Hawai'i 96814, U.S.A.

³ Hawai'i Association for Marine Education and Research,
PMB 175, 5095 Napilihau Street 109B,
Lahaina, Hawai'i 96761, U.S.A.

⁴ PO Box 1329
Maple Falls, WA 98266, U.S.A.

The Pacific Islands Fisheries Science Center's (PIFSC) Cetacean Research Program (CRP) conducted surveys for cetaceans in the waters surrounding Guam and the Commonwealth of the Northern Mariana Islands (CNMI) in an effort to further develop a record of cetacean occurrence in the region.² This was the fourth year conducting cetacean surveys aboard NOAA-chartered small boats (7.6 – 12.2 m) around the southern Mariana Islands of Guam, Rota, Saipan, Tinian, and Aguijan (Figure 1.1). The collected data are being used to reveal the occurrence and distribution, stock structure, and movements of cetaceans within the study area.

All cetacean groups encountered were approached for species confirmation, group size estimates, photo-identification, and biopsy sampling (for assessment of genetic population structure) when possible. For the first time in the Marianas, satellite tags (Wildlife Computers SPOT5) were deployed on individuals of certain species in order to investigate their movements. Additional data collected during each sighting included the location, behavior, best estimates of the number of neonates and young of the year (YOY) (when possible), Beaufort sea state, and swell height. Environmental data (e.g., Beaufort sea state, swell height) and effort status were recorded regularly as conditions changed. Global Positioning System

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(GPS) readings of the vessel's track were automatically recorded once per minute. The occurrences and locations of turtles were recorded but neither photos nor biological samples were collected. In addition to the surveys, two High-Frequency Acoustic Recording Packages (HARPs) previously deployed near Tinian and Saipan were recovered and redeployed.

Surveys were conducted during 30 days (Guam: 10 d, Rota: 6 d, Saipan/Tinian/Aguijan: 14 d), and a total of 3208 km of trackline were surveyed (Table 1, Figs. 1.1-4.1). There were a total of 42 sightings of 8 cetacean species (bottlenose dolphin, false killer whale, pantropical spotted dolphin, pygmy killer whale, rough-toothed dolphin, short-finned pilot whale, sperm whale, and spinner dolphin) (Table 2). Three of the sightings were mixed species groups of pilot whales and bottlenose dolphins; false killer whales and bottlenose dolphins; and rough-toothed dolphins, bottlenose dolphins, and spinner dolphins. Over 18,500 photos were taken (Table 2). A total of 76 biopsy samples were collected during 28 sightings of the 8 cetacean species and 8 sloughed skin samples were collected from sperm whales (Table 2). Ten satellite tags were deployed (2 bottlenose dolphins, 4 false killer whales, 1 rough-toothed dolphin and 3 short-finned pilot whales) (Table 2). A total of 68 turtles were observed (Table 3).

Table 1. Summary of surveys for cetaceans in the waters surrounding Guam, Rota, Saipan, Tinian, and Aguijan (22 June – 27 July 2013).

Date (2013)	Location	Survey Description	On Effort Distance (km)	On Effort Time (h:mm)
22-Jun	Guam	Apra Harbor north along shore then zig-zag south	122.8	5:49
23-Jun	Guam	Apra Harbor south zig zag to Cocos then north along shore	111.7	6:15
24-Jun	Guam	Hagåtña north along 300 ftm line to wave buoy then south past Ledge Buoy and in near Buoy 1	74.3	5:04
25-Jun	Guam	Hagåtña south to 11 Mile Reef	129.3	9:51
26-Jun	Guam	Hagåtña north along 200 ftm contour to Ritidian Pt. out to ledge and back in to FAD Buoy 1	71	5:01
27-Jun	Guam	Hagåtña west ~10nmi south to Apra Harbor	45.2	3:08
28-Jun	Guam	Hagåtña to Rota Bank	122.3	8:51
29-Jun	Guam	Apra Harbor south around Cocos to Inarajan Bay out and back to SWside	162.6	7:10

Date (2013)	Location	Survey Description	On Effort Distance (km)	On Effort Time (h:mm)
30-Jun	Guam	Apra Harbor north around Ritidian Pt. to Spinner Bay	142.6	10:26
1-Jul	Guam	Apra Harbor north offshore then in to Double Reef - south tight along shore to Agat	105.3	6:44
4-Jul	CNMI-Rota	Rota West Harbor (Song Song Harbor) to out and around to Sasanhaya Bay then NE along west shore and back	63.1	2:55
5-Jul	CNMI-Rota	Rota circumnavigation counterclockwise at 3nmi distance	121.3	8:42
6-Jul	CNMI-Rota	Rota N following false killer whales 12nmi offshore	87.8	9:29
7-Jul	CNMI-Rota	Rota counterclockwise circumnavigation along shore then out to west	106.1	8:48
9-Jul	CNMI-Rota	Rota NW side - circuit ~1nmi from shore then out to 5nmi	75.1	7:02
10-Jul	CNMI-Rota	Rota west then inshore along NW coast	55.1	3:27
12-Jul	CNMI-Saipan	Saipan clockwise circumnavigation along shore	92.6	7:36
13-Jul	CNMI-Saipan/Tinian	Saipan and Tinian west sides out to Coke Reef and FADs (GG, FF, HH)	113.3	7:09
14-Jul	CNMI-Saipan/Tinian	HARP pickup - Tinian NW to Saipan NW	118.7	7:30
15-Jul	CNMI-Saipan/Tinian/Aguijan	West side off islands approximately 8-9km around Aguijan then nearshore along Tinian west side	130.4	8:37
17-Jul	CNMI-Saipan	Zig-zags off Saipan west side	143.4	9:27
18-Jul	CNMI-Saipan/Marpi Reef	Saipan west to Marpi Reef	110.3	7:58

Date (2013)	Location	Survey Description	On Effort Distance (km)	On Effort Time (h:mm)
19-Jul	CNMI-Saipan/Tinian/Esmeralda Bank	Saipan-Tinian west out to Esmeralda Bank	149.3	9:22
20-Jul	CNMI-Saipan	Saipan west out to 300 Reef; HARP drop	82.9	5:42
21-Jul	CNMI-Saipan/Tinian	Tinian counterclockwise circumnavigation 3-6nmi offshore; HARP drop	124.4	8:05
23-Jul	CNMI-Saipan	Saipan NW circuit offshore	99	8:29
24-Jul	CNMI-Saipan/Tinian	Tinian clockwise circumnavigation-alongshore on east side and SW side to offshore on NW	124.4	8:43
25-Jul	CNMI-Saipan/Tinian	Saipan-Tinian west circuit offshore	105.4	5:52
26-Jul	CNMI-Saipan/Tinian	Tinian west side	87.8	4:55
27-Jul	CNMI-Saipan/Tinian/Aguijan	Saipan-Tinian west side to Aguijan north side	130.4	8:32
Total:			3207.9	216:39

Table 2. Details of the cetacean sightings (22 June - 27 July 2013). A neonate was defined as a newborn calf with fetal folds showing. A YOY (Young Of the Year) was defined as a calf $\leq \frac{1}{2}$ the size of an adult. *Sloughed skin samples were collected from sperm whales only.

Date (2013)	Sight No.	Species (Scientific)	Species (Common)	Time Begin (GMT +10)	Time End (GMT +10)	Location	Latitude	Longitude	Best Group Size Estimate	Best No. YOY	Best No. Neonates	No. Photos	No. Biopsy / Skin* Samples	No. Satellite Tag Deployed
22-Jun	1	<i>Pseudorca crassidens</i>	False killer whale	11:52	12:52	Guam	13.5310	144.6114	4	1	0	28	0	0
23-Jun	2	<i>Stenella longirostris</i>	Spinner dolphin	10:56	12:08	Guam	13.4007	144.6595	25	0	0	520	0	0
25-Jun	3	<i>Stenella attenuata</i>	Pantropical spotted dolphin	7:12	8:20	Guam	13.5018	144.6131	19	0	0	155	3	0
25-Jun	4	<i>Feresa attenuata</i>	Pygmy killer whale	14:11	15:05	Guam	13.4744	144.6402	8	0	0	578	4	0
28-Jun	5	<i>Stenella longirostris</i>	Spinner dolphin	6:05	6:31	Guam	13.4845	144.7543	20	0	0	381	0	0
30-Jun	6a	<i>Tursiops truncatus</i>	Bottlenose dolphin	6:13	9:34	Guam	13.4823	144.6507	8	0	0	67	0	0
30-Jun	6b	<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	6:20	8:14	Guam	13.4847	144.6589	29	0	1	1004	2	1
30-Jun	6c	<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	8:19	9:15	Guam	13.5526	144.7137	4	0	0	379	2	1
30-Jun	7	<i>Stenella longirostris</i>	Spinner dolphin	10:52	11:09	Guam	13.6514	144.8784	4	0	0	95	1	0

Date (2013)	Sight No.	Species (Scientific)	Species (Common)	Time Begin (GMT +10)	Time End (GMT +10)	Location	Latitude	Longitude	Best Group Size Estimate	Best No. YOY	Best No. Neonates	No. Photos	No. Biopsy / Skin* Samples	No. Satellite Tag Deployed
30-Jun	8	<i>Stenella longirostris</i>	Spinner dolphin	11:27	12:16	Guam	13.6140	144.9079	34	0	0	109	0	0
30-Jun	8-resight	<i>Stenella longirostris</i>	Spinner dolphin	14:31	14:55	Guam	13.6097	144.9090	34	0	0	312	0	0
30-Jun	9	<i>Stenella longirostris</i>	Spinner dolphin	12:53	14:06	Guam	13.5673	144.9506	55	0	1	432	3	0
30-Jun	10	<i>Stenella attenuata</i>	Pantropical spotted dolphin	16:02	16:23	Guam	13.4899	144.6537	11	0	0	157	1	0
1-Jul	11	<i>Globicephala macrorhynchus</i>	Short-finned pilot whale	12:54	14:58	Guam	13.4023	144.6097	17	0	0	1179	5	1
5-Jul	12	<i>Stenella attenuata</i>	Pantropical spotted dolphin	6:35	7:34	Rota	14.2057	145.1323	4	0	0	48	1	0
5-Jul	12-resight	<i>Stenella attenuata</i>	Pantropical spotted dolphin	7:50	8:41	Rota	14.1293	145.0591	10	0	0	128	6	0
5-Jul	13	<i>Stenella attenuata</i>	Pantropical spotted dolphin	10:19	10:54	Rota	14.0657	145.2172	6	0	0	60	3	0
6-Jul	14a	<i>Pseudorca crassidens</i>	False killer whale	6:03	12:42	Rota	14.1405	145.1260	17	0	0	2161	9	3

Date (2013)	Sight No.	Species (Scientific)	Species (Common)	Time Begin (GMT +10)	Time End (GMT +10)	Location	Latitude	Longitude	Best Group Size Estimate	Best No. YOY	Best No. Neonates	No. Photos	No. Biopsy / Skin* Samples	No. Satellite Tag Deployed
6-Jul	14b	<i>Tursiops truncatus</i>	Bottlenose dolphin	6:05	12:43	Rota	14.1405	145.1260	2	0	0	3	0	0
6-Jul	15	<i>Stenella attenuata</i>	Pantropical spotted dolphin	14:25	15:09	Rota	14.2132	145.1377	35	1	0	322	4	0
7-Jul	16	<i>Stenella longirostris</i>	Spinner dolphin	8:18	9:54	Rota	14.1673	145.2878	60	0	0	392	3	0
7-Jul	17	<i>Pseudorca crassidens</i>	False killer whale	11:22	14:39	Rota	14.1143	145.0680	15	0	0	1162	7	1
9-Jul	18	<i>Stenella longirostris</i>	Spinner dolphin	6:10	6:28	Rota	14.1389	145.1287	14	0	0	34	0	0
9-Jul	19	<i>Tursiops truncatus</i>	Bottlenose dolphin	6:28	8:30	Rota	14.1470	145.1375	12	0	0	805	1	0
9-Jul	20	<i>Stenella attenuata</i>	Pantropical spotted dolphin	8:57	10:02	Rota	14.2205	145.2305	50	1	0	621	0	0
10-Jul	21	<i>Tursiops truncatus</i>	Bottlenose dolphin	10:47	11:53	Rota	14.1976	145.2267	8	0	0	337	0	0
12-Jul	22	<i>Stenella longirostris</i>	Spinner dolphin	6:52	7:55	Saipan	15.2661	145.7792	25	0	0	538	2	0
12-Jul	23	<i>Stenella longirostris</i>	Spinner dolphin	8:25	9:20	Saipan	15.2725	145.8340	40	0	0	406	3	0

Date (2013)	Sight No.	Species (Scientific)	Species (Common)	Time Begin (GMT +10)	Time End (GMT +10)	Location	Latitude	Longitude	Best Group Size Estimate	Best No. YOY	Best No. Neonates	No. Photos	No. Biopsy / Skin* Samples	No. Satellite Tag Deployed
12-Jul	24	<i>Stenella longirostris</i>	Spinner dolphin	11:08	12:03	Saipan	15.1164	145.7585	25	0	0	313	1	0
13-Jul	25	<i>Stenella attenuata</i>	Pantropical spotted dolphin	10:00	10:29	Tinian	15.1438	145.4633	30	0	0	58	0	0
13-Jul	26	<i>Stenella longirostris</i>	Spinner dolphin	12:13	12:50	Saipan	15.2283	145.7057	25	0	0	565	0	0
14-Jul	27	<i>Stenella longirostris</i>	Spinner dolphin	6:13	6:46	Saipan	15.2054	145.6808	14	0	0	45	0	0
15-Jul	28	<i>Stenella longirostris</i>	Spinner dolphin	9:40	10:21	Aguijan	14.8625	145.5803	25	1	0	463	0	0
15-Jul	29a	<i>Tursiops truncatus</i>	Bottlenose dolphin	10:21	11:50	Aguijan	14.8576	145.5831	11	0	0	123	0	1
15-Jul	29b	<i>Steno bredanensis</i>	Rough-toothed dolphin	10:22	11:49	Aguijan	14.8567	145.5820	6	0	0	297	1	1
15-Jul	29c	<i>Stenella longirostris</i>	Spinner dolphin	10:35	11:00	Aguijan	14.8606	145.5827	2	0	0	9	0	0
17-Jul	30	<i>Tursiops truncatus</i>	Bottlenose dolphin	12:29	13:32	Saipan	15.2505	145.7060	3	0	0	132	1	0
17-Jul	31	<i>Tursiops truncatus</i>	Bottlenose dolphin	13:49	14:58	Saipan	15.2041	145.6968	6	0	0	447	3	1

Date (2013)	Sight No.	Species (Scientific)	Species (Common)	Time Begin (GMT +10)	Time End (GMT +10)	Location	Latitude	Longitude	Best Group Size Estimate	Best No. YOY	Best No. Neonates	No. Photos	No. Biopsy / Skin* Samples	No. Satellite Tag Deployed
18-Jul	32	<i>Stenella longirostris</i>	Spinner dolphin	8:42	9:03	Marpi Reef	15.4197	145.8687	8	1	0	15	0	0
18-Jul	33	<i>Stenella longirostris</i>	Spinner dolphin	9:20	9:59	Marpi Reef	15.4135	145.8752	65	2	0	279	0	0
18-Jul	33-resight	<i>Stenella longirostris</i>	Spinner dolphin	10:53	11:43	Marpi Reef	15.4315	145.8867	55	1	0	337	0	0
19-Jul	34	<i>Stenella longirostris</i>	Spinner dolphin	6:31	7:08	Saipan	15.2179	145.6702	7	0	0	239	1	0
20-Jul	35	<i>Steno bredanensis</i>	Rough-toothed dolphin	17:17	17:52	Saipan	15.2340	145.6200	4	0	0	299	1	0
21-Jul	36	<i>Stenella longirostris</i>	Spinner dolphin	7:09	7:37	Saipan	15.2104	145.6957	17	0	0	511	0	0
21-Jul	37	<i>Stenella longirostris</i>	Spinner dolphin	14:17	14:42	Saipan	15.1734	145.6914	17	0	0	44	0	0
23-Jul	38	<i>Physeter macrocephalus</i>	Sperm whale	6:54	11:10	Saipan	15.3423	145.5861	8	0	0	213	1+8*	0
23-Jul	39	<i>Tursiops truncatus</i>	Bottlenose dolphin	12:32	13:25	Saipan	15.2989	145.7068	5	0	0	200	1	0
24-Jul	40	<i>Stenella longirostris</i>	Spinner dolphin	6:30	7:11	Saipan	15.1923	145.6830	30	0	0	404	1	0
24-Jul	41	<i>Stenella longirostris</i>	Spinner dolphin	8:35	9:42	Tinian	14.9912	145.6727	45	0	0	664	4	0

Date (2013)	Sight No.	Species (Scientific)	Species (Common)	Time Begin (GMT +10)	Time End (GMT +10)	Location	Latitude	Longitude	Best Group Size Estimate	Best No. YOY	Best No. Neonates	No. Photos	No. Biopsy / Skin* Samples	No. Satellite Tag Deployed
27-Jul	42	<i>Stenella longirostris</i>	Spinner dolphin	8:58	10:16	Aguijan	14.8593	145.5817	40	1	0	449	1	0
Total:												18519	84	10

Table 3. Turtle sightings (22 June - 27 July, 2013). GPS locations (lat/long) are those of the vessel and not the exact locations of the turtles observed.

Date (2013)	Time (GMT +10)	Island	Latitude	Longitude	Description
22-Jun	8:26	Guam	13.5172	144.7966	Turtle-large (>2.5 ft)
23-Jun	10:36	Guam	13.3537	144.6375	Green Turtle-med (1.5-2.5 ft)
23-Jun	10:49	Guam	13.3887	144.6495	Turtle-med (1.5-2.5 ft)
23-Jun	10:52	Guam	13.3958	144.6547	Green Turtle-med (1.5-2.5 ft)
23-Jun	12:16	Guam	13.4062	144.6576	Turtle-med (1.5-2.5 ft)
24-Jun	11:19	Guam	13.4852	144.7518	Turtle-med (1.5-2.5 ft)
28-Jun	6:33	Guam	13.4929	144.7625	Turtle-med (1.5-2.5 ft)
29-Jun	10:39	Guam	13.2879	144.6476	Green Turtle-large (>2.5 ft)
30-Jun	10:44	Guam	13.6585	144.8586	Turtle-med (1.5-2.5 ft)
30-Jun	10:45	Guam	13.6590	144.8602	Turtle-med (1.5-2.5 ft)
30-Jun	11:22	Guam	13.6261	144.9002	Green Turtle-small (<1.5 ft)
30-Jun	12:34	Guam	13.5996	144.9578	Green Turtle-med (1.5-2.5 ft)
30-Jun	14:27	Guam	13.6082	144.9087	Green Turtle-small (<1.5 ft)
1-Jul	8:53	Guam	13.4573	144.6183	Green Turtle-med (1.5-2.5 ft)
7-Jul	8:12	Rota	14.1547	145.2754	Turtle-med (1.5-2.5 ft)
7-Jul	8:13	Rota	14.1555	145.2771	Turtle-med (1.5-2.5 ft)
7-Jul	10:32	Rota	14.1776	145.1919	Turtle-med (1.5-2.5 ft)
10-Jul	12:52	Rota	14.1363	145.1332	Turtle-med (1.5-2.5 ft)
12-Jul	8:09	Saipan	15.2906	145.8090	Turtle-small (<1.5 ft)
12-Jul	8:13	Saipan	15.2874	145.8174	Green Turtle-med (1.5-2.5 ft)
12-Jul	8:55	Saipan	15.2694	145.8340	Green Turtle-med (1.5-2.5 ft)
12-Jul	9:20	Saipan	15.2675	145.8324	Green Turtle-large (>2.5 ft)
12-Jul	9:25	Saipan	15.2616	145.8298	Turtle-med (1.5-2.5 ft)

Date (2013)	Time (GMT +10)	Island	Latitude	Longitude	Description
12-Jul	9:27	Saipan	15.2592	145.8282	Turtle-med (1.5-2.5 ft)
12-Jul	9:27	Saipan	15.2585	145.8261	Turtle-med (1.5-2.5 ft)
12-Jul	9:42	Saipan	15.2358	145.8065	Turtle-med (1.5-2.5 ft)
12-Jul	13:22	Saipan	15.2052	145.6986	Turtle-med (1.5-2.5 ft)
13-Jul	12:05	Saipan	15.2187	145.6884	Green Turtle-med (1.5-2.5 ft)
13-Jul	12:05	Saipan	15.2194	145.6893	Green Turtle-med (1.5-2.5 ft)
13-Jul	12:15	Saipan	15.2280	145.7046	Green Turtle-med (1.5-2.5 ft)
13-Jul	12:53	Saipan	15.2169	145.6914	Turtle-med (1.5-2.5 ft)
13-Jul	13:07	Saipan	15.2265	145.7194	Green Turtle-small (<1.5 ft)
14-Jul	14:09	Saipan	15.2270	145.6983	2x Green Turtle-med (1.5-2.5 ft)
15-Jul	5:58	Saipan	15.2273	145.7181	Green Turtle-med (1.5-2.5 ft)
15-Jul	14:21	Saipan	15.2257	145.7019	Green Turtle-med (1.5-2.5 ft)
15-Jul	14:32	Saipan	15.2238	145.7227	Green Turtle-med (1.5-2.5 ft)
17-Jul	13:36	Saipan	15.2077	145.6831	Green Turtle-med (1.5-2.5 ft)
17-Jul	15:19	Saipan	15.2044	145.6991	Green Turtle-med (1.5-2.5 ft)
17-Jul	15:20	Saipan	15.2088	145.7002	Green Turtle-med (1.5-2.5 ft)
18-Jul	14:08	Saipan	15.2273	145.7200	Green Turtle-med (1.5-2.5 ft)
19-Jul	15:20	Saipan	15.2258	145.6988	Green Turtle-med (1.5-2.5 ft)
19-Jul	15:22	Saipan	15.2269	145.7033	Green Turtle-med (1.5-2.5 ft)
19-Jul	15:29	Saipan	15.2261	145.7206	Turtle-med (1.5-2.5 ft)
20-Jul	12:51	Saipan	15.2274	145.6953	Turtle-small (<1.5 ft)
20-Jul	18:20	Saipan	15.2274	145.6976	Green Turtle-med (1.5-2.5 ft)
21-Jul	7:03	Saipan	15.2275	145.7041	2x Turtle-med (1.5-2.5 ft)
21-Jul	7:04	Saipan	15.2260	145.7008	Turtle-small (<1.5 ft)

Date (2013)	Time (GMT +10)	Island	Latitude	Longitude	Description
21-Jul	7:05	Saipan	15.2249	145.6999	Turtle-small (<1.5 ft)
21-Jul	7:06	Saipan	15.2215	145.6982	Turtle-med (1.5-2.5 ft)
21-Jul	7:40	Saipan	15.2059	145.6954	Turtle-med (1.5-2.5 ft)
21-Jul	14:50	Saipan	15.1919	145.6954	Turtle-small (<1.5 ft)
23-Jul	13:58	Saipan	15.2285	145.6849	Turtle-med (1.5-2.5 ft)
24-Jul	6:11	Saipan	15.2223	145.7232	Green Turtle-large (>2.5 ft)
24-Jul	6:19	Saipan	15.2184	145.6969	Turtle-med (1.5-2.5 ft)
24-Jul	6:20	Saipan	15.2164	145.6962	Green Turtle-large (>2.5 ft)
24-Jul	6:22	Saipan	15.2109	145.6939	Turtle-med (1.5-2.5 ft)
24-Jul	14:34	Saipan	15.2196	145.6913	Green Turtle-large (>2.5 ft)
25-Jul	11:35	Saipan	15.2225	145.6960	Turtle-small (<1.5 ft)
25-Jul	11:45	Saipan	15.2255	145.7204	Green Turtle-med (1.5-2.5 ft)
26-Jul	10:50	Saipan	15.2234	145.6936	Turtle-med (1.5-2.5 ft)
26-Jul	10:51	Saipan	15.2254	145.6964	Green Turtle-med (1.5-2.5 ft)
26-Jul	10:52	Saipan	15.2260	145.6983	Turtle-med (1.5-2.5 ft)
26-Jul	10:54	Saipan	15.2273	145.7035	Green Turtle-med (1.5-2.5 ft)
26-Jul	10:56	Saipan	15.2277	145.7080	Turtle-med (1.5-2.5 ft)
26-Jul	10:59	Saipan	15.2276	145.7163	Green Turtle-med (1.5-2.5 ft)
27-Jul	6:00	Saipan	15.2262	145.7209	Green Turtle-med (1.5-2.5 ft)

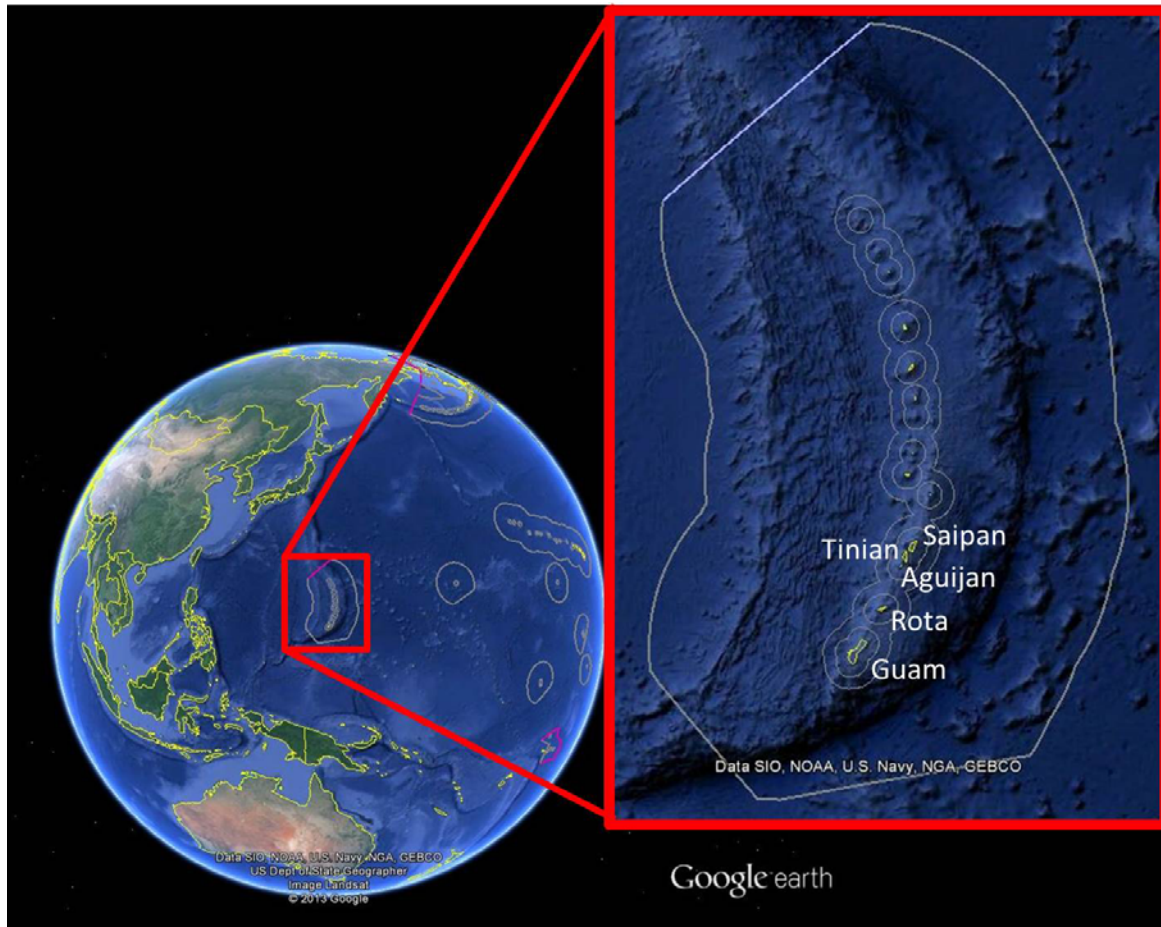


Figure 1.1: Guam and the Commonwealth of the Northern Mariana Islands Exclusive Economic Zone (CNMI EEZ; outer grey line within the red box) and the survey area within the southern Mariana Islands.

The following sections contain periodic updates that were written during the field project and posted to the NOAA PIFSC blog at <http://pifscblog.wordpress.com>. Some of the information provided contains raw or preliminary data that have not been confirmed or quality checked.

Guam Summary (June 22-July 1)

Posted July 8, 2013

This year off of Guam, we conducted 10 days of surveys using two different vessels (5 surveys aboard each). The first was a 9.4 m Bertram Sport Fisherman with flying bridge and twin diesel inboard engines (*Lucky Strike*) and the other was a 7.6 m Pro-Line with a 4-stroke outboard engine (*Pro-Line 25*). During the 10 days of effort we covered 1087 km of trackline (Figure 2.1). Our surveys were primarily focused on the west side of the island because of predominant winds from the east.

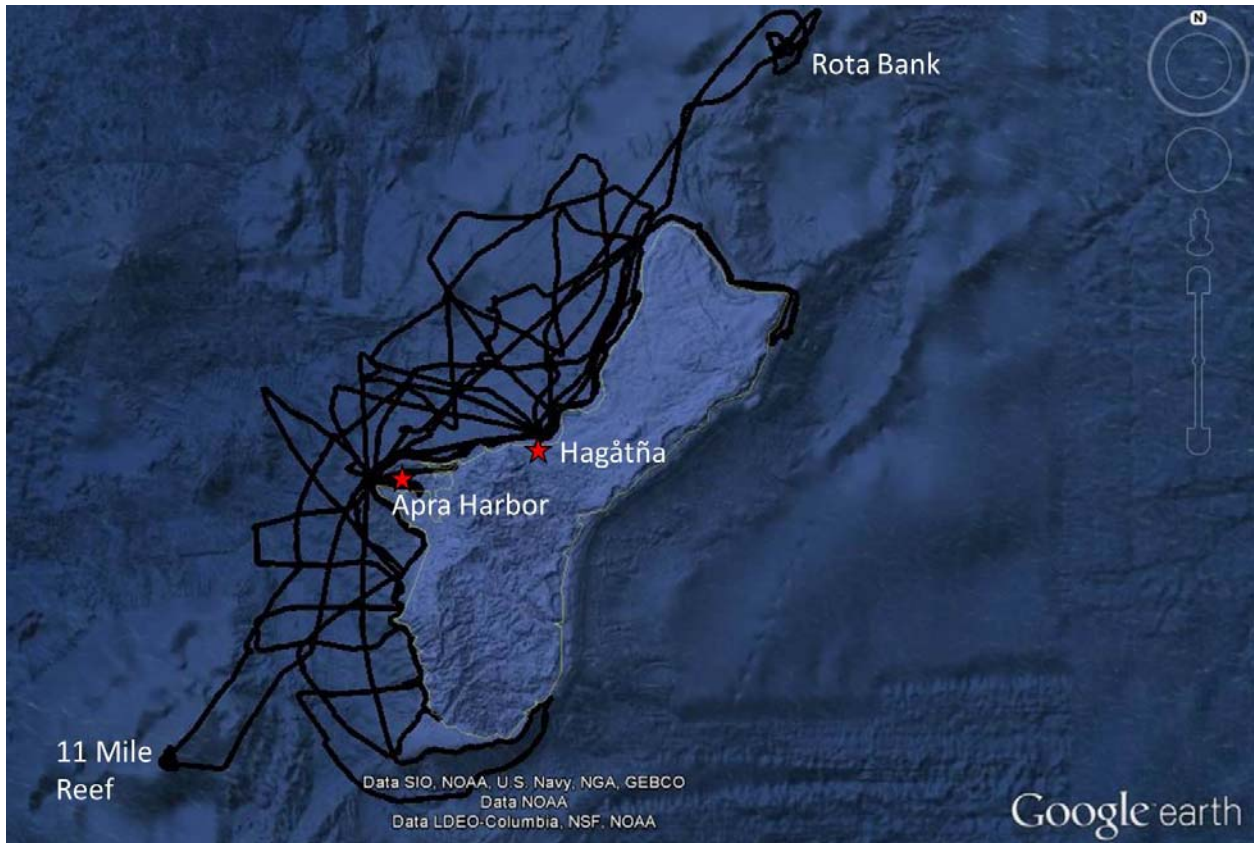


Figure 2.1: Guam survey tracklines (22 June – 01 July, 2013). *Lucky Strike* departed from Hagåtña Boat Basin and the *Pro-Line 25* departed from Apra Harbor.

We have had an exciting start to this year’s surveys. Not only have we added false killer whales (*Pseudorca crassidens*) (Figure 3.1) as a new species to our list of encounters, but we have successfully deployed three satellite tags on short-finned pilot whales (*Globicephala macrorhynchus*) from three separate groups.



Figure 3.1: False killer whale (*Pseudorca crassidens*) encountered off the west side of Guam approximately 8 km from shore (photo credit: Adam Ü, collected under NMFS permit 15240).

Two of the groups of short-finned pilot whales had individuals that we have photographed in previous years and are a part of our photo-identification catalog. We currently have 129 individuals in our catalog. The first whale that we tagged (PTT 128884) was a member of a group of approximately 30 individuals including a male who has the most distinctive fin of all (Figure 4.1). We have seen this male and some of his other group members off Rota in September 2011 and off Guam in May 2012. The tagged individual was also photographed off Rota in 2011.

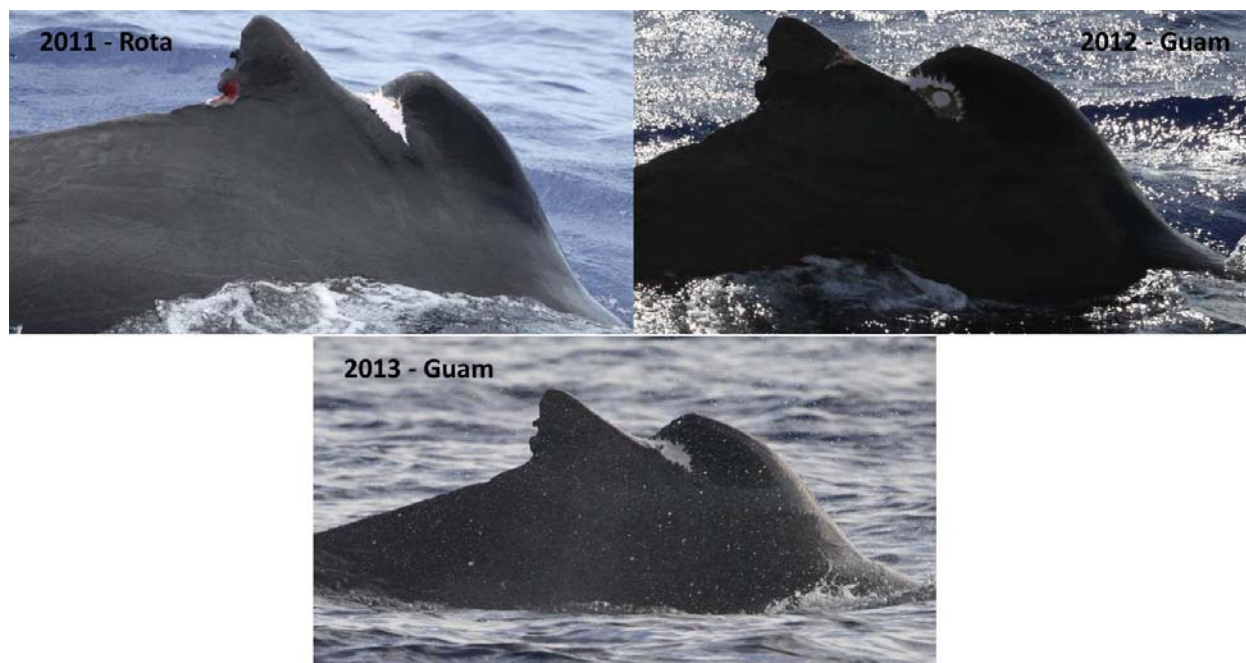


Figure 4.1: Male pilot whale within our photo-identification catalog seen three years in a row (MIGm-000057; “Chop-Top”) (photo credit: Erik Norris and Marie Hill, collected under NMFS permit 14097 in 2011 and 15240 in 2012).

The second tagged individual (PTT 128885) (Figure 5.1) was in a group of four. They were approximately 1.2 km from the first group and were traveling slowly in the same direction. Their dive behavior was very different from the others though. They were making longer duration dives (18-20 min) while the first group dove for approximately 5-8 min at a time. All four individuals were photographed off of Tinian in September 2011 and one was photographed by another research group in March 2012 off of Guam. During these encounters with the short-finned pilot whales, a small group of bottlenose dolphins (approximately 8-10) were close by and between the groups and traveling in the same direction. Three individuals approached the boat to bow ride. Two of these individuals were photographed last year (one off of Guam and the other off of Saipan).



Figure 5.1: Short-finned pilot whale satellite tagged (PTT 128885) off of Guam on June 30, 2013 (photo credit: Marie Hill, collected under NMFS permit 15240).

A third short-finned pilot whale was satellite tagged on July 1 and was a member of a group of 17 individuals that have not been photographed by us before. None of the most obviously marked individuals could be found within our existing catalog. Although all three tagged animals were encountered in close proximity in both time and space (a maximum of one day and 20 km), they moved to very different locations in the few days after they were tagged (Figure 6.1).



Figure 6.1: Tracklines of satellite tagged short-finned pilot whales (128884, 128885, 128886) showing the most recently recorded transmission locations (July 3, 2013 @ 02:07 GMT). The satellite tagging operations were conducted under NMFS permit 15240. The plotted tracks are based on raw satellite transmission data and have not been quality checked. The final products may vary from those shown.

In addition to false killer whales and short-finned pilot whales we encountered spinner dolphins (*Stenella longirostris*), pantropical spotted dolphins (*Stenella attenuata*), bottlenose dolphins (*Tursiops truncatus*), and pygmy killer whales (*Feresa attenuata*) (Figure 7.1). The pygmy killer whales (Figure 8.1) were another exciting encounter because we have only seen them here once before and this was the first time that we have been able to approach them for photos and biopsy sampling. Across all encounters we collected just under 5400 photos and 21 biopsy samples. Our next stop is Rota. We are excited and hope for continued success!

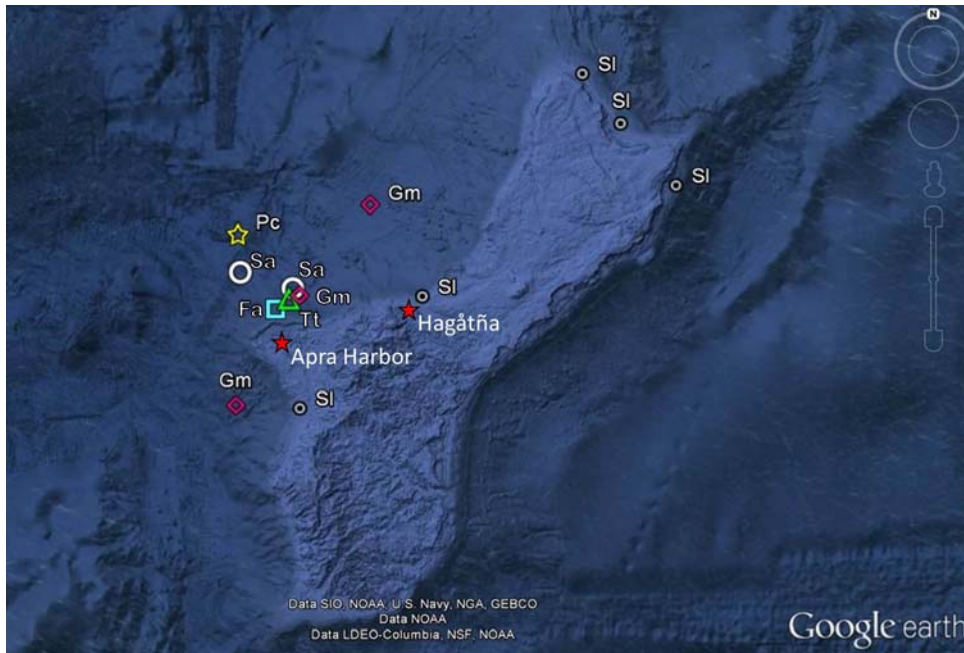


Figure 7.1: Locations of cetacean sightings around Guam (n = 11). Fa-*Feresa attenuata* (pygmy killer whales), Gm-*Globicephala macrorhynchus* (short-finned pilot whale), Pc- *Pseudorca crassidens* (false killer whale), Sa-*Stenella attenuata* (pantropical spotted dolphin), SI-*Stenella longirostris* (spinner dolphin), Tt-*Tursiops truncatus* (bottlenose dolphin).



Figure 8.1: Pygmy killer whales (*Feresa attenuata*) off of Guam (photo credit: Adam Ü, collected under NMFS permit 15240).

Rota Summary (July 4 – 10)

Posted July 15, 2013

This is our third year conducting surveys off of Rota, and we completed six days of surveys aboard two vessels (three surveys aboard each). One was a 12.2m Ocean Alexander Sport-fisher with twin diesel inboards and flying bridge (*Sr. Dung*) and the other was a 7.1m Boston Whaler (*Nacrina*). Over the six days we surveyed 509km of trackline (Figure 1.2).

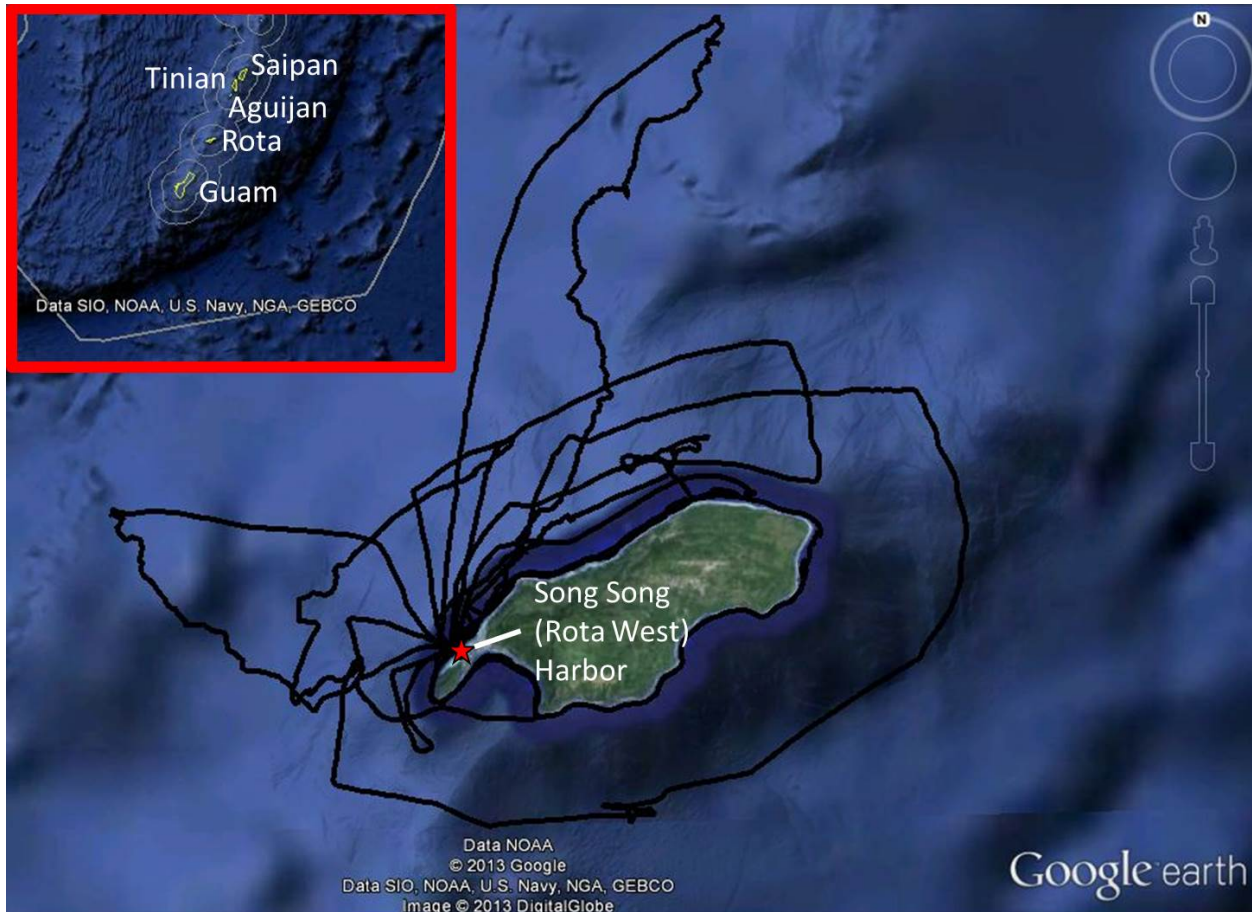


Figure 1.2: Survey tracklines around Rota (4-10 July, 2013). Both survey vessels departed from Song Song Harbor. Inset: The southern Mariana Islands.

We were hoping that the excitement from our previous two weeks working off of Guam would continue and Rota did not disappoint (see the Guam summary above for the details of these surveys). On 6 July, just as we were leaving the harbor mouth we had a sighting of false killer whales (*Pseudorca crassidens*) and bottlenose dolphins (*Tursiops truncatus*). We followed the false killer whales for approximately 40km (the northernmost trackline in Figure 1.2). There were a total of 16-26 individuals that were in multiple subgroups spread out over several kilometers. We collected over 2100 photos, 9 biopsy samples and deployed 3 satellite tags (PTT 128903, 128904, 128906). We also witnessed three feeding events in which some of the

animals from the different subgroups converged on, killed, and shared fish (two were tunas and the third was a marlin) (Figure 2.2). One of the tagged individuals (128906) (Figure 3.2) participated in the marlin feeding event along with eleven other individuals.



Figure 2.2: False killer whale grabbing a tuna on the surface of the water before taking it under. Photo credit: Marie Hill, collected under NMFS permit 15240.



Figure 3.2: False killer whale satellite tagged off of Rota (PTT 128906). Photo credit: Adam Ü, collected under NMFS permit 15240.

As if that day wasn't exciting enough the very next day we had another encounter with false killer whales! This was a completely different group of 13-18 individuals. They were spread over approximately a kilometer but joined together to kill and share a marlin (Figure 4.2).

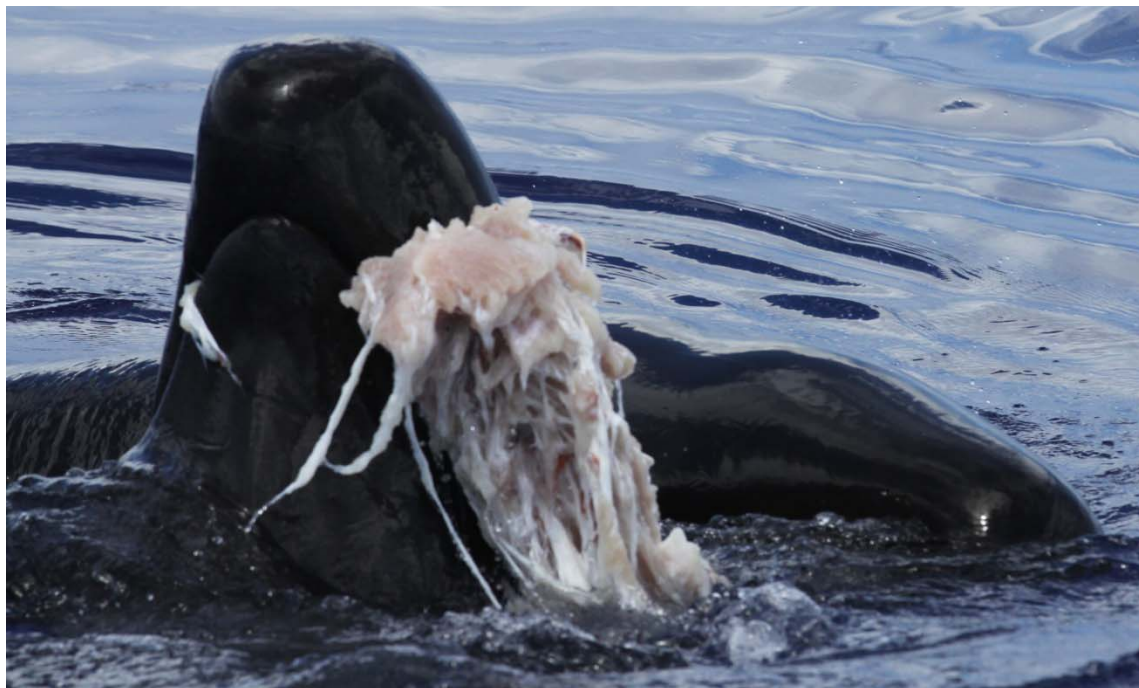


Figure 4.2: False killer whale with part of a marlin in its mouth. Photo credit: Marie Hill, collected under NMFS permit 15240.

During this encounter with the false killer whales we collected over 1100 photos, 7 biopsy samples and deployed 1 satellite tag (PTT 128908).

All four satellite-tagged false killer whales have traveled long distances since their tags were attached (Figure 5.2). The three whales tagged on the first day (6 July) traveled north-northeast together before splitting up. The tagged false killer whales 128903 and 128904 remained together and traveled west toward the West Mariana Ridge, while 128906 headed back south after going north to Guguan. The most recently reported satellite transmission from tagged false killer whale 128906 indicates that it is approximately 94km west of Saipan. Saipan is the location of our next basecamp for our continuing surveys. Maybe we will see these whales again. The false killer whale tagged on 7 July (128908) traveled to the northwest approximately 70km before heading due south toward Tracey Seamount and beyond, then turned west.

A comparison of photos from the two false killer whale encounters off Rota with the two distinctive individuals photographed during our first survey day off of Guam revealed no matches.

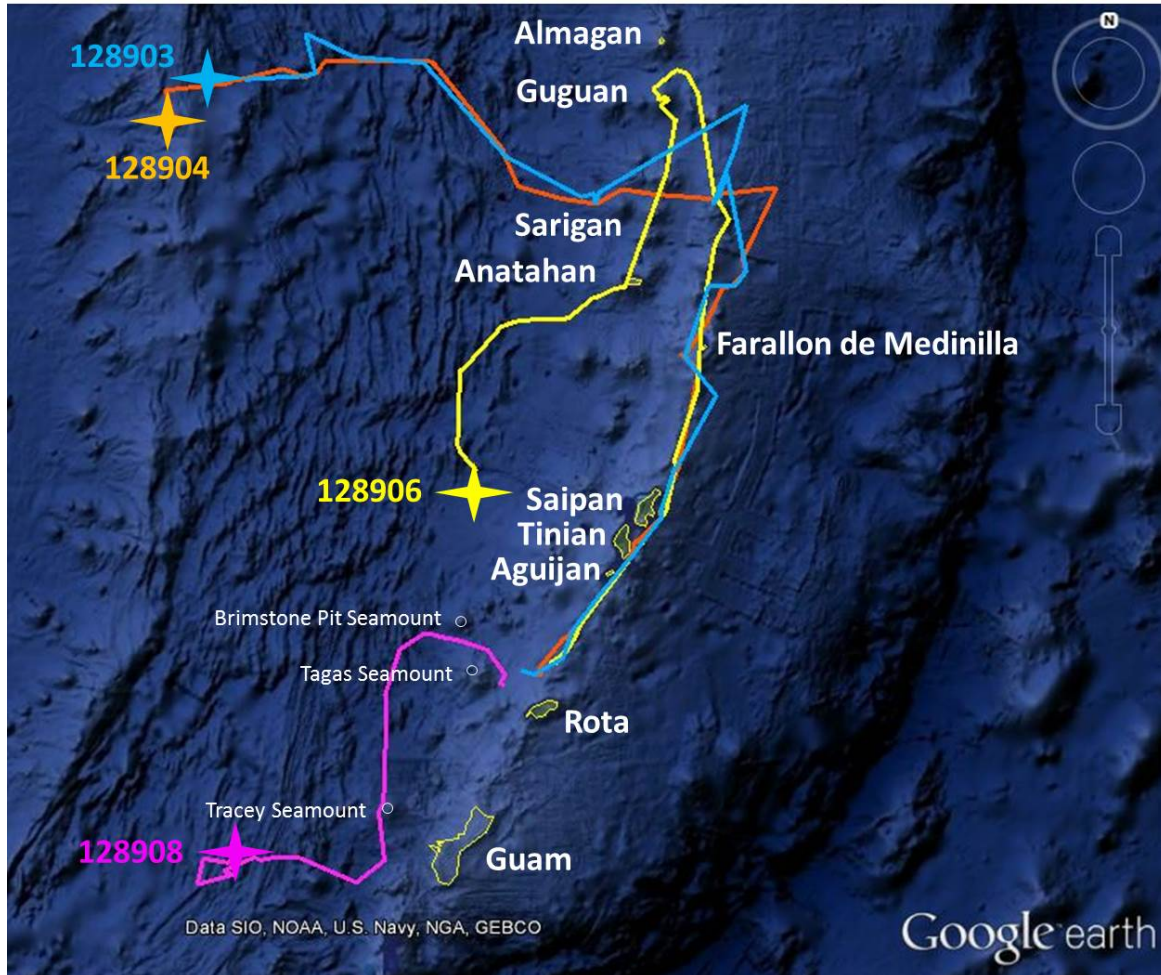


Figure 5.2: Tracks of the false killer whales satellite tagged off the northwest side of Rota on 6 and 7 July, 2013 (local time). The last positions shown (stars) were on 11 July @ 9:00 (local time) for tags 128903, 128906, and 128908 and on 10 July @ 5:00 (local time). All whales were tagged under NMFS permit 15240 and CNMI Fish and Game License 02694. The plotted tracks are based on raw satellite transmission data and have not been quality checked. The final products may vary from those shown.

In addition to false killer whales, we encountered three other species off Rota: bottlenose dolphins (*Tursiops truncatus*), spinner dolphins (*Stenella longirostris*), and pantropical spotted dolphins (*Stenella attenuata*) (Figure 6.2).



Figure 6.2: Locations of cetacean sightings around Rota (5-10 July, 2013). Pc- *Pseudorca crassidens* (false killer whale), Sa- *Stenella attenuata* (pantropical spotted dolphin), Sl- *Stenella longirostris* (spinner dolphin), Tt- *Tursiops truncatus* (bottlenose dolphin).

During our second encounter of bottlenose dolphins off Rota (9 July), one of the dolphins was an individual that we photographed on 30 June off Guam during the mixed encounter with pilot whales (*Globicephala macrorhynchus*) (Figure 7.2). Seven other individuals within this group of twelve are a part of our photo-identification catalog of bottlenose dolphins and were photographed previously off Rota in 2012. In addition, during our 2011 surveys two of the dolphins were photographed off Guam and three others were photographed off Saipan. On 10 July we encountered 8 of the bottlenose dolphins from the previous day's group, including the individual that was photographed off Guam on 30 June. The two encounter locations off Rota were approximately 12km apart (Figure 6.2).



Figure 7.2: Bottlenose dolphin photographed off Guam on 30 June, 2013 and then off Rota on 9 July, 2013.

The two *Stenella* species continue to be our most frequently encountered species. This year off Rota we had four encounters with and one resight of pantropical spotted dolphins and two encounters with spinner dolphins (a total of 6 and 7 encounters for the year respectively). Unlike previous years, we encountered a group of pantropical spotted dolphins off the south side of Rota (Figure 6). We have not created photo-identification catalogs yet for these dolphins so we do not know whether they are the same individuals that we have photographed before.

We do have a catalog of spinner dolphins that includes 89 individuals from Saipan, Tinian, Aguijan, and Rota. During our first encounter this year off Rota we photographed 8 of 22 cataloged individuals previously photographed off Rota. On 9 July, our second encounter with spinners off Rota ended early because bottlenose dolphins showed up on the scene and took priority. We did however get a photo of one cataloged individual from the previous encounter. If we had remained with them, it is likely that we would have collected more photos of cataloged spinner dolphins.

We will continue our surveys of the Southern Marianas by working in the waters surrounding Saipan, Tinian, and Aguijan (12-30 July). We look forward to continued success and possibly some resights of our tagged individuals.

Satellite Tagged Pilot Whale Update:

All three pilot whales that were satellite tagged off Guam continue to have transmitting tags. They have made some interesting movements since our previous report on 3 July (Figure 8.2). At that time they were in three separate locations. Satellite tagged pilot whale 128884 was off the west side of Tinian, 128885 was south of Rota, and 128886 was on the southwest coast of

Guam. Over the past week tagged pilot whale 128885 returned south on the east side of Guam, met up with 128886 and they spent several days together off of the southwest side of Guam and at Galvez Bank. These two whales were tagged on separate days and have not been previously photographed together. During this time tagged pilot whale 128884 visited the west side of Saipan then looped around Tinian and headed back down south along the east side of Rota and Guam, then visited Galvez Bank (on a different day than the others). On 11 July all three satellite tagged pilot whales were off Guam. Tagged pilot whale 128885 was off Santa Rosa Bank approximately 55km southwest of Guam. Tagged pilot whales 128884 and 128886 were both off the west side of Guam; both close to the locations where they were each tagged.

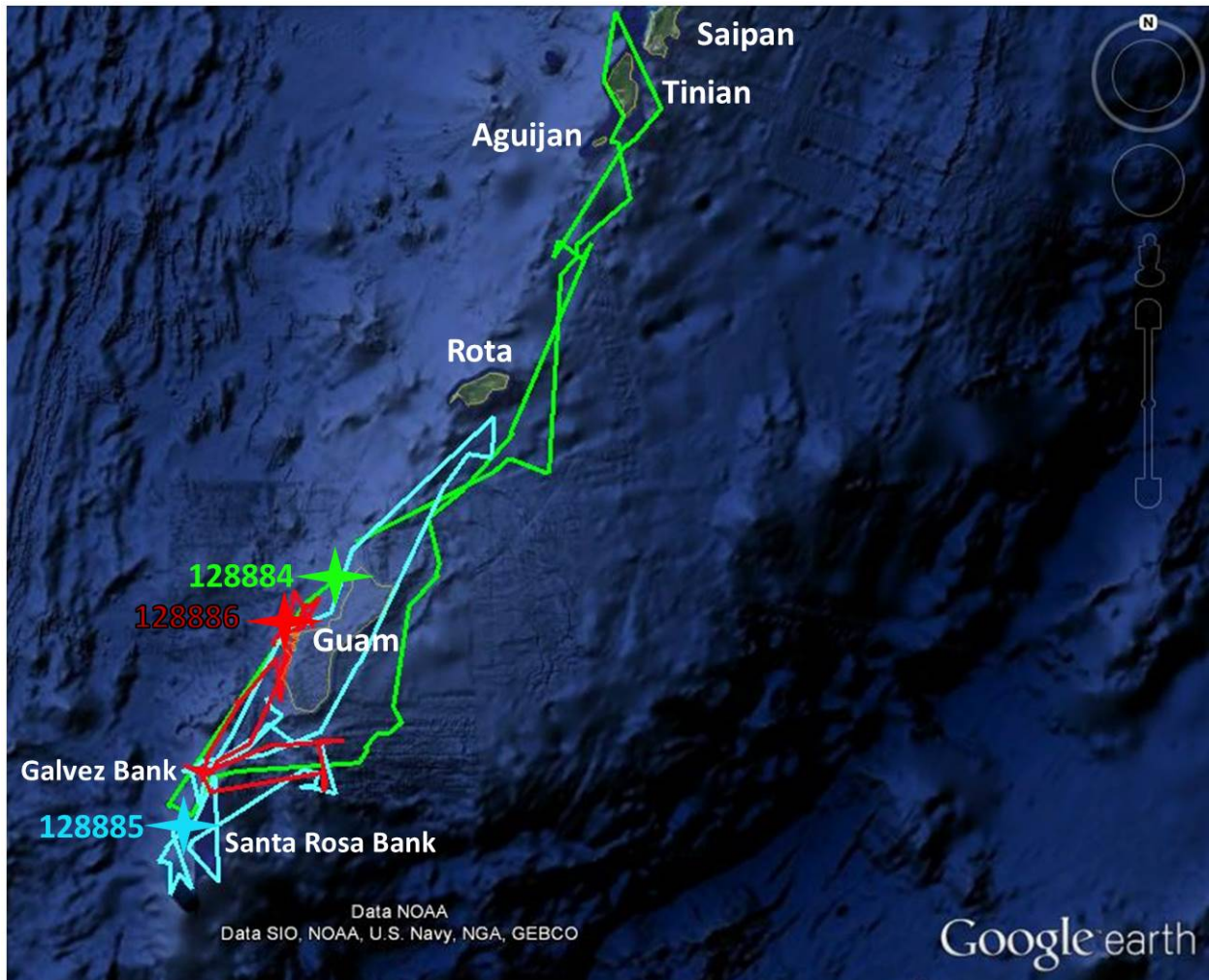


Figure 8.2: Tracks of pilot whales satellite tagged off of Guam (30 June and 1 July, 2013). Most recently reported locations were on 11 July. All three pilot whales were tagged under NMFS permit 15240. The plotted tracks are based on raw satellite transmission data and have not been quality checked. The final products may vary from those shown.

Saipan, Tinian, Aguijan Summary (July 12-27)

Posted August 5, 2013

We are wrapping up this year's project here in the Marianas and have completed our small boat surveys for cetaceans in the waters surrounding Saipan, Tinian, and Aguijan. Over a period of 14 days we surveyed more than 1600 km of trackline using two different vessels (Figure 1.3). The first was a 12.2m Sport-fisher with twin diesel inboards and flying bridge, *Sea Hunter* (6 days). The second vessel was a 7.9 m Regulator with twin outboard engines, *Regulator* (8 days).

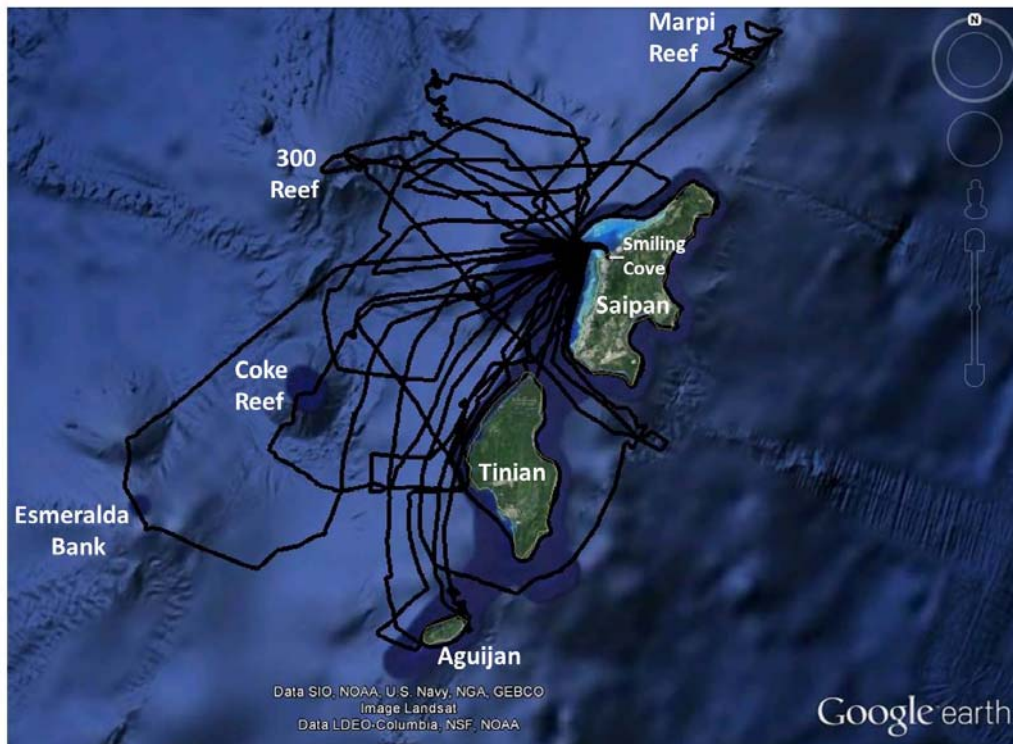


Figure 1.3: Survey tracklines around Saipan, Tinian, and Aguijan (12-27 July, 2013). Both survey vessels departed from the Smiling Cove Small Boat Marina on Saipan.

This continues to be a year for firsts as we have added another species to our list of encounters since the overall project began in 2010. We were incredibly thrilled to encounter rough-toothed dolphins (*Steno bredanensis*) off Aguijan (Goat Island). They are one of the most unusual looking species of dolphin with their sloping heads and mottled body coloration (Figure 2.3). They also have great dorsal fins for photo-identification. This was a small group of six individuals. We collected photo-Ids from all, a biopsy sample from one and deployed a satellite tag on another.



Figure 2.3: Rough-toothed dolphins photographed off of Aguijan on 15 July, 2013 (Photo credit: Adam Ü, collected under NMFS permit 15240).

In the days since the tag (128896) was deployed (15 July), the Steno has roamed back and forth (north and south) along the west sides of Saipan, Tinian, and Aguijan (Figure 3). The tag has transmitted for a total of 12 days. We resighted the group on 20 July off of Saipan after getting a satellite transmission update (smart phones can be a helpful technology in the field if there is cellular telephone service). Only four of the six individuals were present. We collected photo-IDs and another biopsy sample.



Figure 3.3: Track of the satellite tagged rough-toothed dolphin 128896. The satellite tagging operations were conducted under NMFS permit 15240 and CNMI Fish and Game License 02694. The satellite tag tracks shown are based on raw transmission data and have not been quality checked. The final products may vary from those shown.

During the first encounter with the rough-toothed dolphins (on 15 July) we also experienced another first when we had three different species bow riding at the same time! First, individuals from a group of bottlenose dolphins (*Tursiops truncatus*) were swimming right alongside the rough-toothed dolphins then a couple of spinner dolphins (*Stenella longirostris*) from a nearby group came along to follow the other two species. What an incredible sight!



Figure 4.3: Bottlenose dolphin breaching in the waters off of Aguijan on 15 July, 2013 (Photo credit: Adam Ü, collected under NMFS permit 15240).

Two of the bottlenose dolphins are part of our existing photo-identification catalog. Both were photographed last year; one was at Rota Bank (between Guam and Rota) and the other was near Orote Pt. off the west side of Guam.

During the 15 July encounter we deployed a satellite tag on a bottlenose dolphin (128897). Although the tagged bottlenose dolphin moved up and down the west sides of Saipan, Tinian, and Aguijan in the days immediately following the tagging events (Figure 5.3), it did not travel with the tagged Steno. On 18 July the tagged bottlenose dolphin's track apparently began matching that of the tagged false killer whale 128904 (see Figure 2.5 in the Marianas Cetacean Surveys 2013: Updates on Our Satellite Tagged False Killer Whales (July 12 – 27)). On the day that we tagged this false killer whale off of Rota there were bottlenose dolphins present. We were only able to get a photo of one of the bottlenose dolphins and a preliminary it does not match any that we have photographed before or since. We do not know if the satellite tagged bottlenose dolphin 128897 was present on that day. The satellite tagged bottlenose dolphin and false killer whale apparently traveled along the same route through 20 July. After that the bottlenose dolphin (128897) returned south and apparently met up again with the tagged Steno 128986 along the north side of Aguijan on 25 July. They were separated by the following day and the most recently reported position (27 July) of the bottlenose dolphin (128897) was off the east side of Tinian (Figure 4). The satellite tag has transmitted for a total of 12 days.

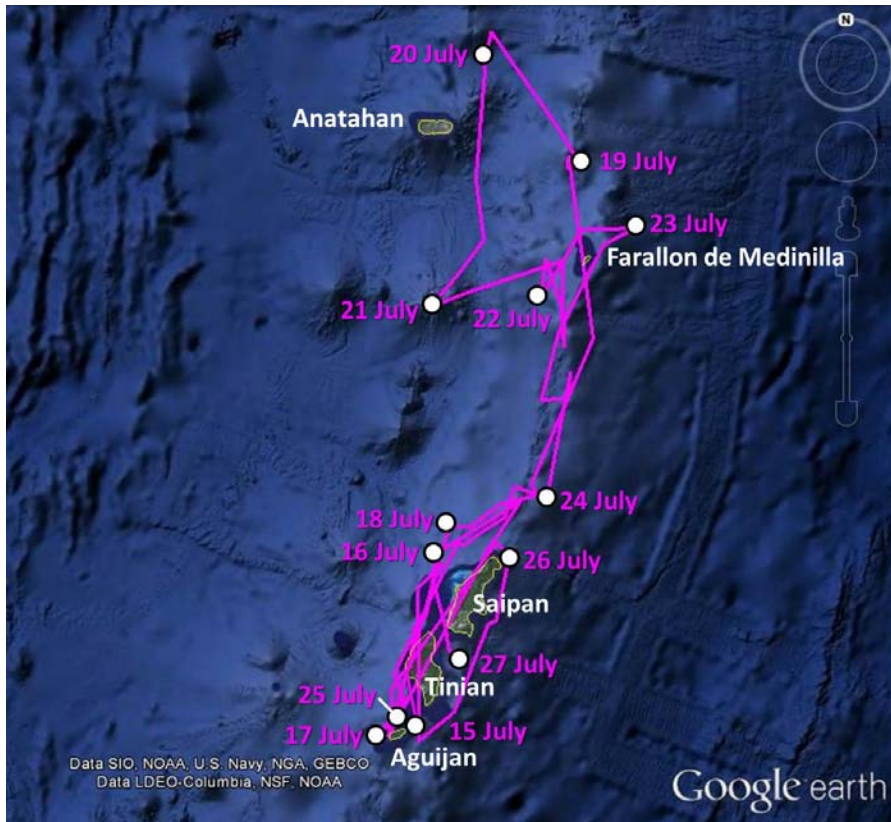


Figure 5.3: Track of the satellite tagged bottlenose dolphin 128987. The satellite tagging operations were conducted under NMFS permit 15240 and CNMI Fish and Game License 02694. The satellite tag tracks shown are based on raw transmission data and have not been quality checked. The final products may vary from those shown.

Only two days after deploying a satellite tag on our first bottlenose dolphin we had another encounter with bottlenose dolphins off the west side of Saipan during which we deployed another satellite tag (128898). This was a completely different group of individuals. One of the dolphins was already in our catalog. We had photographed and collected a biopsy sample from it during an encounter off of Rota in 2012. The satellite tagged bottlenose dolphin (128898) has primarily moved up and down along the west sides of Saipan, Tinian, and Aguijan with a trip out to Coke Reef on 22 July (Figure 6.3). The most recent transmission from tag 128898 was on 26 July at 9:26 when the bottlenose dolphin was approximately 23 km west of Aguijan. It is possible that the tag is no longer transmitting because we have received messages from our other tagged individuals since that time but not from 128898. The tag has transmitted for a total of 8 days.



Figure 6.3: Track of satellite tagged bottlenose dolphin 128898. The satellite tagging operations were conducted under NMFS permit 15240 and CNMI Fish and Game License 02694. The satellite tag tracks shown are based on raw transmission data and have not been quality checked. The final products may vary from those shown.

Just when we thought that things couldn't possibly get more interesting, we had an encounter with sperm whales (*Physeter macrocephalus*) off the northwest side of Saipan (Figure 7.3). What is even more interesting is that they were within a kilometer of the only other sperm whale sighting that we have had in this area, which was in 2010. We also had one sighting off Guam in 2010, but no others until now.



Figure 7.3: Sperm whale photographed off Saipan on 23 July, 2013 (Photo credit: Marie Hill, collected under NMFS permit 15240).

Updates on Our Satellite Tagged Short-finned Pilot Whales (July 12 – 26)

Posted July 29, 2013



Figure 1.4: Short-finned pilot whales spy-hopping in the waters off of Guam. (Photo credit: Adam Ü, collected under NMFS permit 15240).

Our last update on the satellite tagged short-finned pilot whales (*Globicephala macrorhynchus*) described them spending much of their time around Guam (check out our previous blog <http://pifscblog.wordpress.com/2013/07/15/marianas-cetacean-surveys-2013-rota-summary-july-4-10/>). On July 11, two (128884 and 128886) were close to shore off the west side of Guam, while the third (128885) was at Santa Rosa Reef. Since then, the satellite tagged whale 128884 made an almost full clockwise circuit around Guam before traveling north beyond Rota (Figure 2.4). We were hoping the whale might travel up to Saipan again as it had done in the beginning of July, but it turned back toward the south on 16 July. The satellite tag stopped transmitting on 18 July when the whale was just northeast of Rota Bank. The total tag transmission was 19 days.

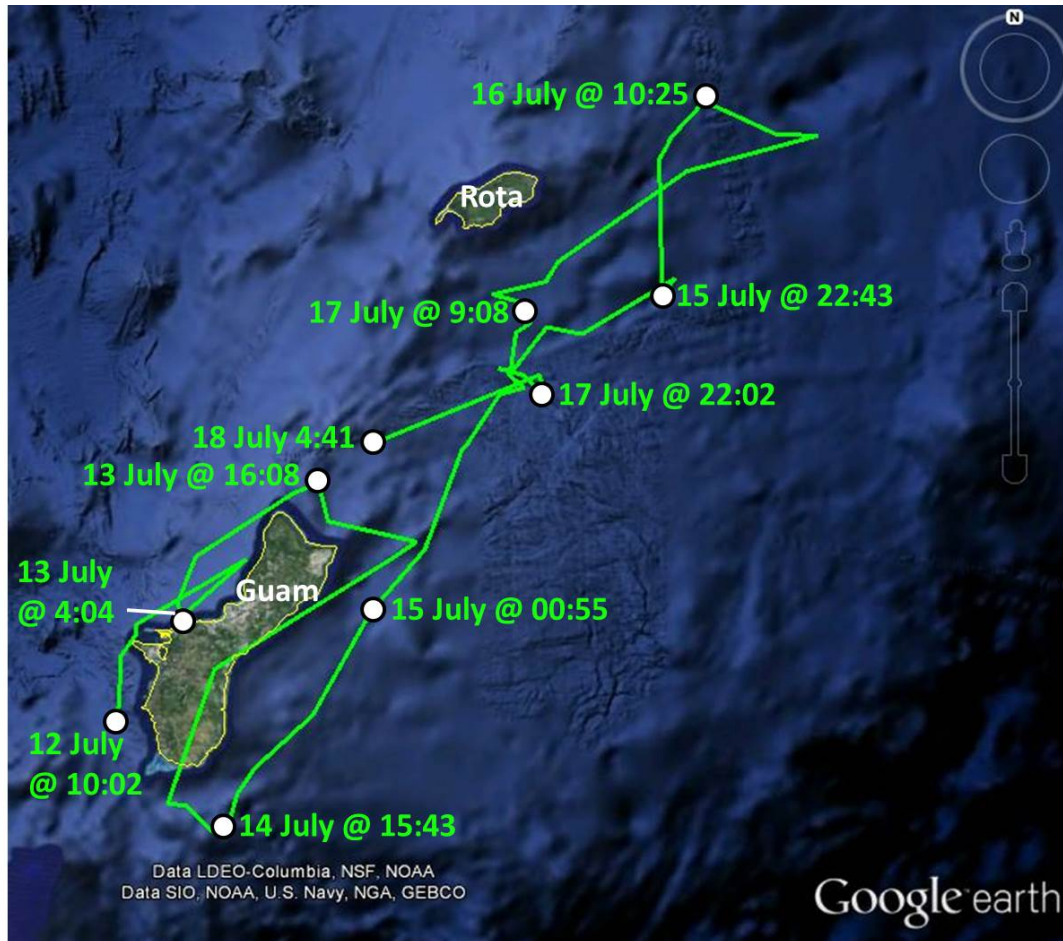


Figure 2.4: Track of satellite tagged short-finned pilot whale 128884 (12-26 July, 2013). The satellite tagging operations were conducted under NMFS permit 15240. The plotted tracks are based on raw satellite transmission data and have not been quality checked. The final products may vary from those shown.

The second satellite tagged short-finned pilot whale (128885) has made some incredible movements since 12 July when it was hanging out at Santa Rosa Reef (Figure 3.4). Within a span of 5 days this whale traveled nearly 500 km south toward the Federated States of Micronesia, crossing over the Mariana Trench (Figure 3.4). The southwest end of the Trench, also known as Challenger Deep, is the deepest known point in the World's Oceans (10.9 km or 6.8 mi deep). On 18 July, this whale returned to Guam and was recently located approximately 16 km off the northwest point of the Island on 26 July. The tag has been transmitting for 27 days.

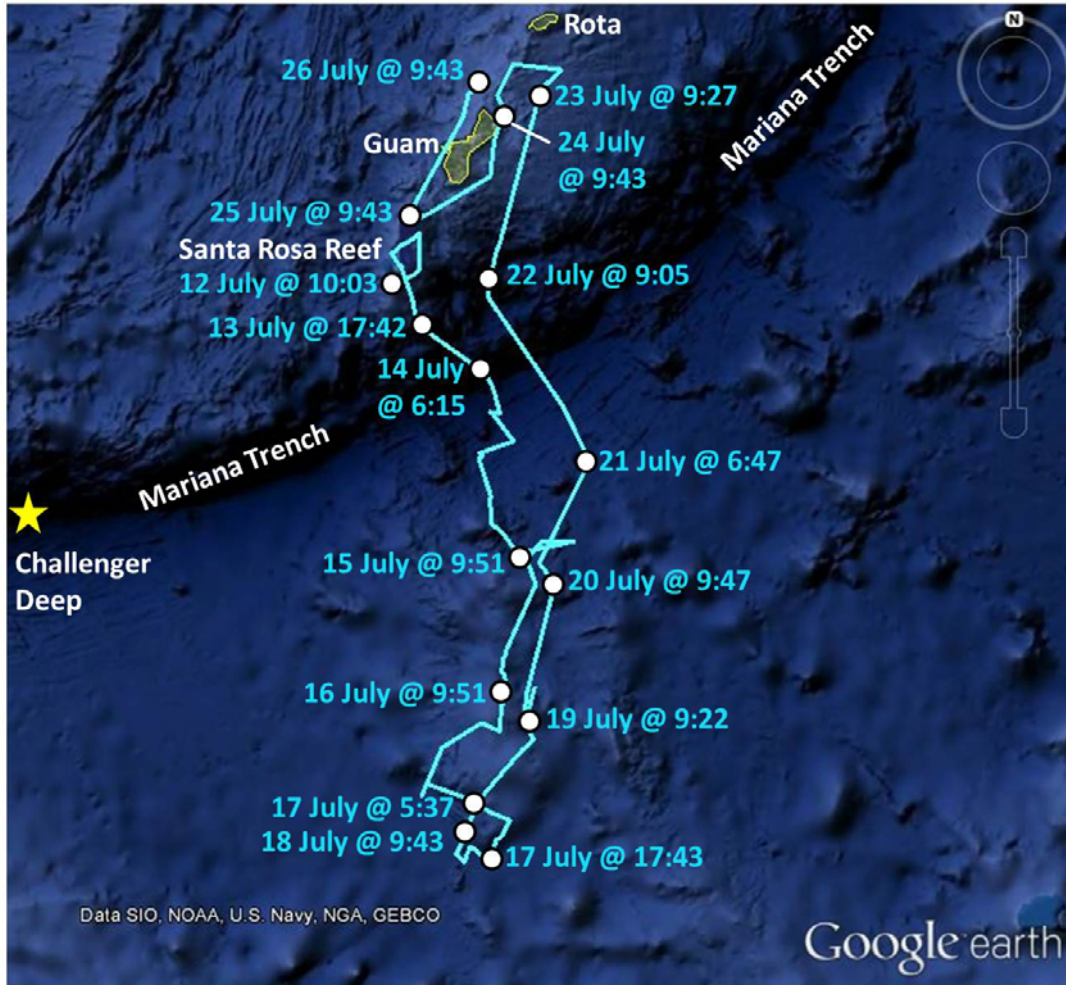


Figure 3.4: Track of satellite tagged short-finned pilot whale 128885 (12-26 July, 2013). The satellite tagging operations were conducted under NMFS permit 15240. The plotted tracks are based on raw satellite transmission data and have not been quality checked. The final products may vary from those shown.

The third and final satellite tagged short-finned pilot whale (128886), tagged the day after the first two, has primarily hung around Guam and north of the Island since 12 July (Figure 4.4). On 17 July, both 128884 and 128886 were located in the same area approximately 30 km southeast of Rota (Figures 2.4 and 4.4). Tag 128886 has been transmitting for 25 days.

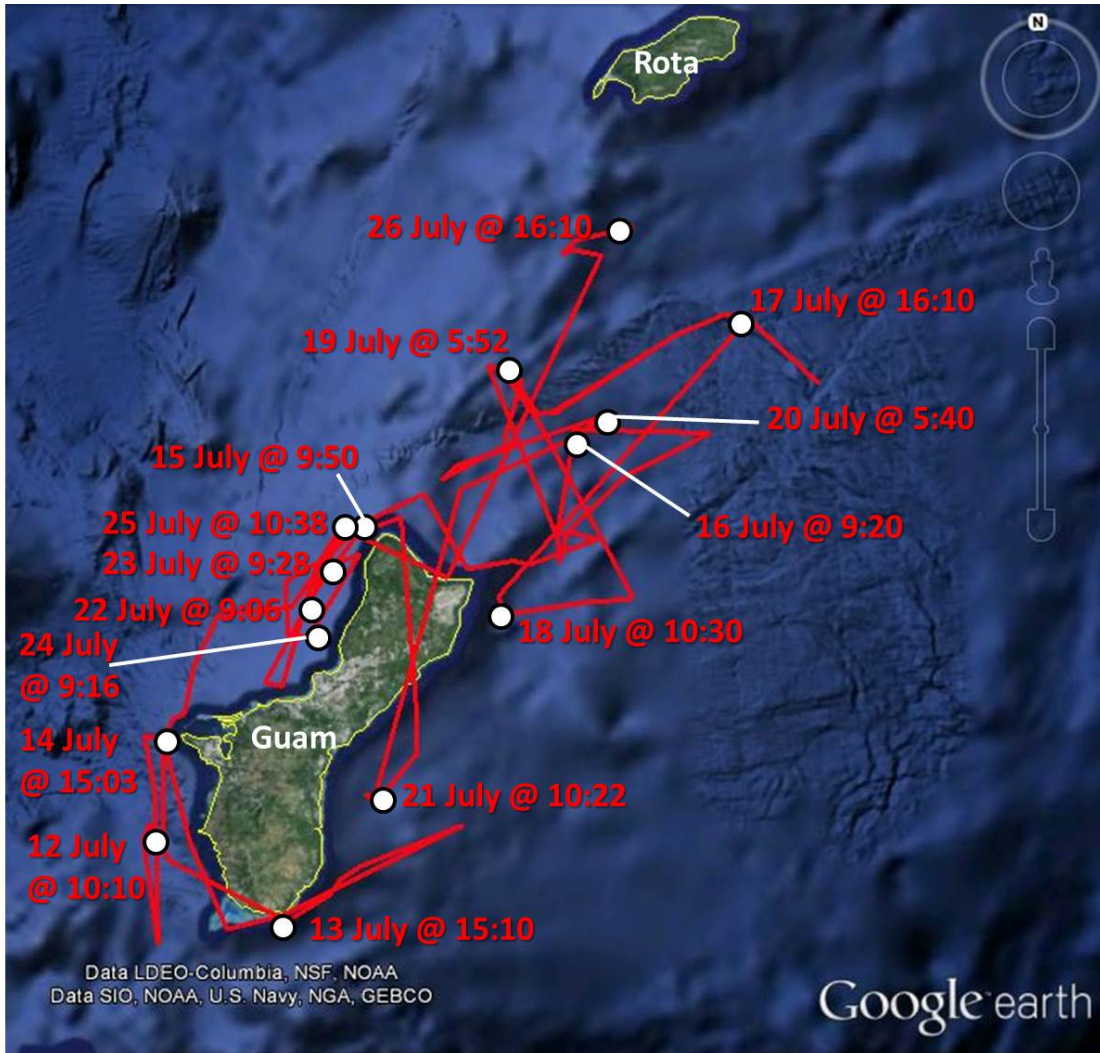


Figure 4.4: Track of satellite tagged short-finned pilot whale 128886 (12-26 July, 2013). The satellite tagging operations were conducted under NMFS permit 15240. The plotted tracks are based on raw satellite transmission data and have not been quality checked. The final products may vary from those shown.

Stay tuned for more updates on the movements of our satellite tagged false killer whales (*Pseudorca crassidens*) and our surveys around Saipan, Tinian, and Aguijan.

Updates on Our Satellite Tagged False Killer Whales (July 12 – 27)

Posted July 30, 2013



Figure 1.5: False killer whale photographed off of Rota. (Photo credit: Marie Hill, collected under NMFS permit 15240).

At the beginning of July we deployed four satellite tags on false killer whales (*Pseudorca crassidens*) during our surveys around Rota (<http://pifscblog.wordpress.com/2013/07/15/marianas-cetacean-surveys-2013-rota-summary-july-4-10/>). The first satellite tag (128903), deployed on 6 July, transmitted for four days. During that four day period the first satellite tagged whale traveled with the second satellite tagged false killer whale (128904). It is possible that the two whales continued to travel together beyond those four days. On 11 July, the tagged whale 128904 was over the West Mariana Ridge, more than 280 km west of Guguan (Figure 2.5). Over the next four days the tagged whale traveled south along the ridge then returned to the waters off of Rota and Guam. The whale then moved north along the Island chain never staying in one place for very long. During the last transmission reported here the tagged false killer whale was approximately 50 km west-southwest of Farallon de Medinilla. The tag has transmitted for a total of 21 days.

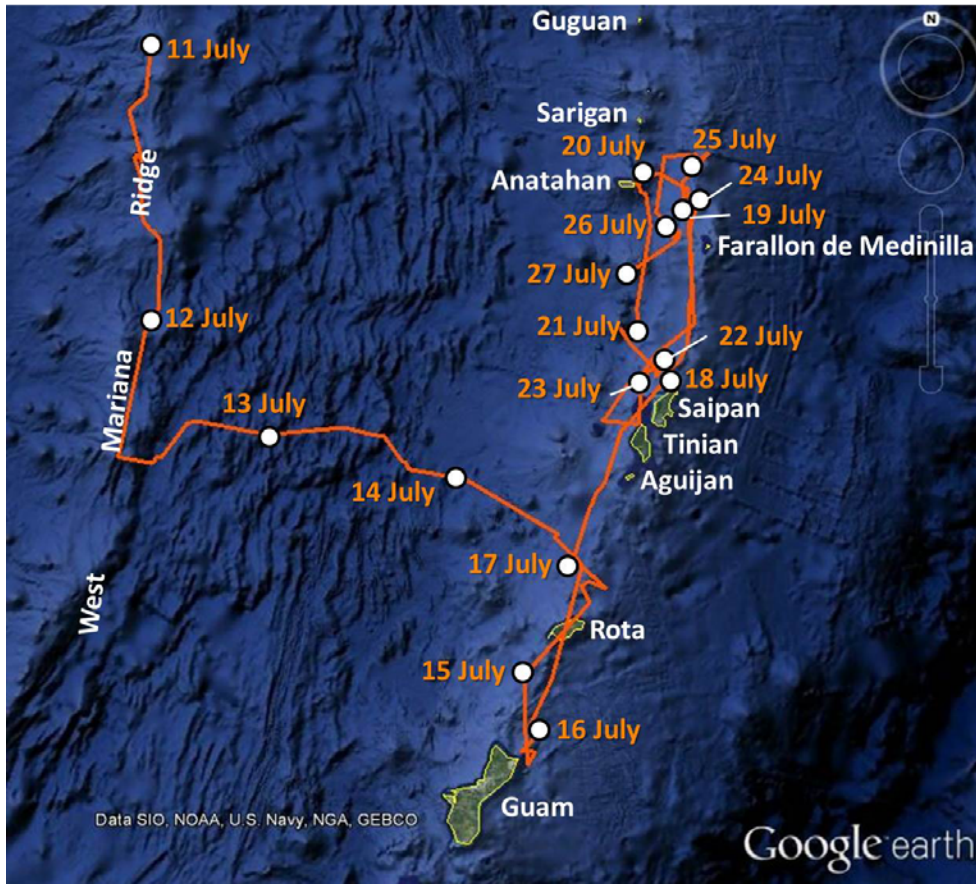


Figure 2.5: Track of satellite tagged false killer whale 128904. The satellite tagging operations were conducted under NMFS permit 15240 and CNMI Fish and Game License 02694. The satellite tag tracks shown are based on raw transmission data and have not been quality checked. The final products may vary from those shown.

The third satellite tagged false killer whale (128906) was tagged on the same day as the first two but was in a separate subgroup. We last reported that this tagged whale was approximately 76 km due west of Saipan on 11 July (Figure 3.5). Since then, the whale has made a large counterclockwise circuit moving north along the Island chain to Guguan, west to the West Mariana Ridge, eventually making its way back to the Island chain on 21 July. On 23 July, satellite tagged whales 128904 and 128906 joined up off the northwest side of Saipan and moved north again just beyond Anatahan (Figures 2.5-3.5). On 27 July these two satellite-tagged whales were still together, approximately 50 km west-southwest of Farallon de Medinilla. Tag 128906 has also transmitted for a total of 21 days.

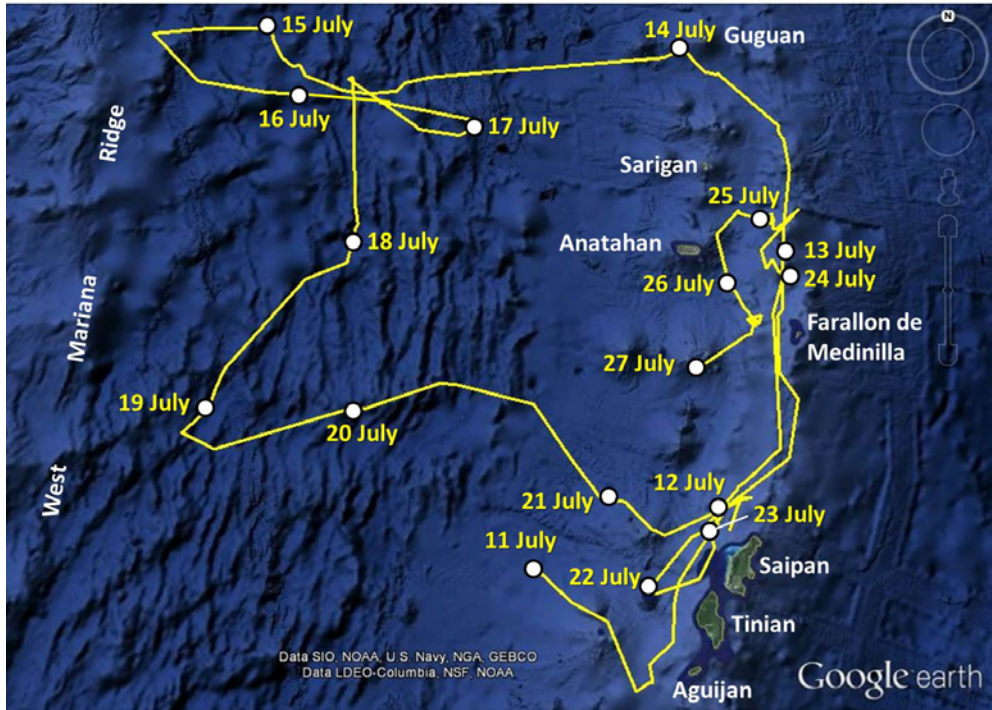


Figure 3.5: Track of satellite tagged false killer whale 128906. The satellite tagging operations were conducted under NMFS permit 15240 and CNMI Fish and Game License 02694. The satellite tag tracks shown are based on raw transmission data and have not been quality checked. The final products may vary from those shown.

The fourth and final satellite tagged false killer whale (128908) was tagged on 7 July, the day after the first three were tagged. After being tagged, this whale moved to the south and spent most of its time within the Mariana Trough (Figure 4.5). Between 21 and 23 July 128908 made a trip out to the West Mariana Ridge. To date, this tagged whale has remained south of Farallon de Medinilla and has not joined up with any of the other satellite tagged false killer whales. The satellite tag 128908 has transmitted for a total of 20 days.

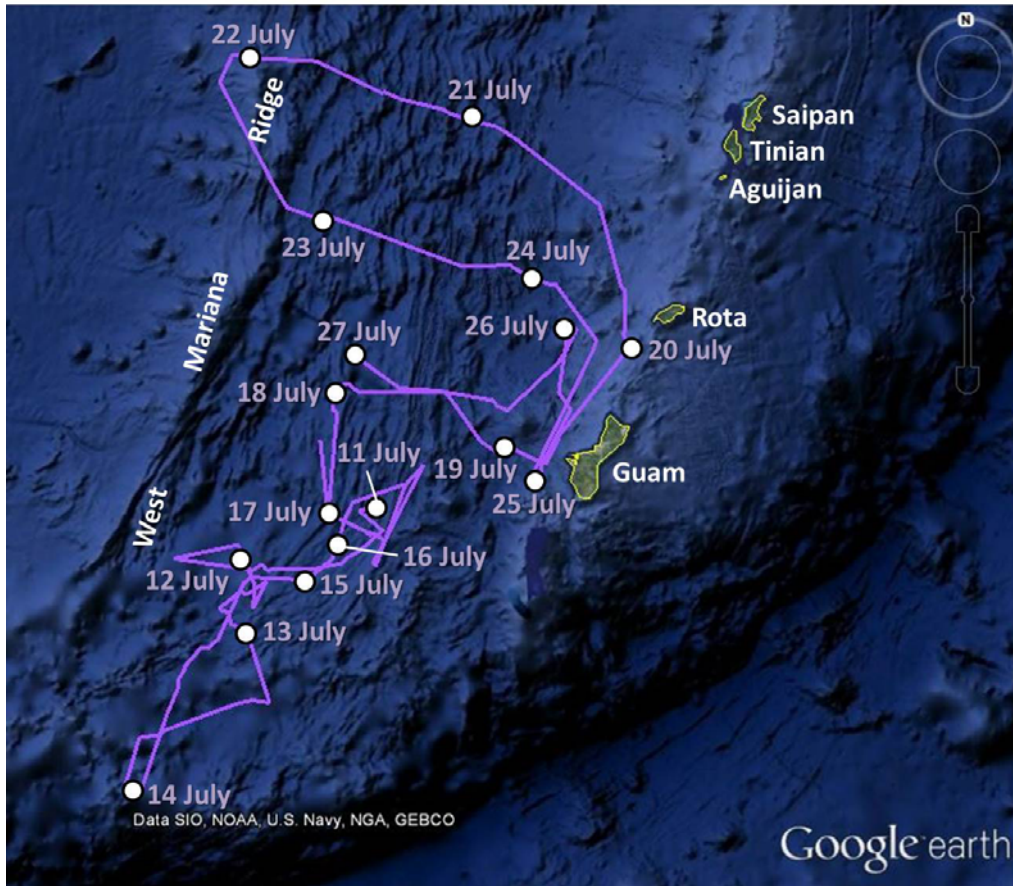


Figure 4.5: Track of satellite tagged false killer whale 128908. The satellite tagging operations were conducted under NMFS permit 15240 and CNMI Fish and Game License 02694. The satellite tag tracks shown are based on raw transmission data and have not been quality checked. The final products may vary from those shown.