

# MARINE MAMMAL & TURTLE DIVISION, WEEKLY HIGHLIGHTS

## Field work:

### *Week of 30 January 2017*

*Antarctic Whale Ecology and Health, Antarctic Peninsula, Jan-Feb* – The research team of John Durban (MMTD/SWFSC), Holly Fearnbach (SR3) and Leigh Hickmott (Open Ocean Consulting) successfully completed 21 flights last week with an unmanned hexacopter, week 2 of this season's effort, collecting vertical images from 35 Type A killer whales, seven Arnoux's beaked whales and five humpback whales. These will provide the first photogrammetry data for Arnoux's beaked whales and Type A killer whales, and contribute to a comparison of humpback whale condition on different feeding grounds (Antarctic Peninsula, Cape Cod and the coastal waters of British Columbia/Washington State). Notably the Type A killer whales were imaged carrying and consuming a southern elephant seal – this prey species was only documented from the aerial perspective. This research is made possible in part by a grant and ship time from Lindblad and National Geographic. For more information contact [john.durban@noaa.gov](mailto:john.durban@noaa.gov).

### *Week of 23 January 2017*

*Antarctic whale ecology and health, week 1 report* – This week saw the commencement of annual field work on the ecology of top predators (killer whales) and top krill consumers (large whales) around Antarctic Peninsula. The research team of John Durban (MMTD/SWFSC), Holly Fearnbach (SR3) and Leigh Hickmott (Open Ocean Consulting) are being hosted onboard the expedition ship National Geographic Explorer, with the primary aim of assessing the health of whales in this rapidly-changing ecosystem. The team will be using a small hexacopter to collect vertical images for assessing body condition, and to collect whale blow samples to identify respiratory microbiome and disease agents using genetic techniques. This week the team crossed the Drake Passage from Argentina, have completed preparatory flight checks and are now ready to begin data collection. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov)



Research team, from right to left: Leigh Hickmott, Holly Fearnbach, John Durban and Chimo (hexacopter)

*North Atlantic Right Whale Health Assessment, Fernandina Beach, FL, January* – North Atlantic right whales were hard to find this past week off Fernandina Beach, FL, despite lots of search effort. Nonetheless, six more hexacopter flights were conducted with further blow samples obtained from one of the adult females that was imaged last week. The team from SWFSC/MMTD, Woods Hole Oceanographic Institution and NEFSC's Large Whale Team will now break until mid-February, when we hope to encounter more right whales to assess body condition and sample blow microbiome. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) [Photo: Overhead image of the open blowhole of a North Atlantic right whale, taken when an unmanned hexacopter was descending to collect a blow sample. Genetic analysis of samples will be used to identify respiratory microbiome and possible disease agents. Research approach of whales using UAS was authorized by NMFS permit #17355.]



*California Sea Lion Census and Diet Research, Channel Islands, Southern California Bight, quarterly* – Mark Lowry and Morgan Lynn will travel to San Nicolas Island on January 23-25 to collect California sea lion scat samples for diet analysis. Mark Lowry and Jim Carretta will travel to San Clemente Island on January 27-30 to collect California sea lion scat samples for diet analysis and to count pinnipeds.

#### *Week of 16 January 2017*

*North Atlantic Right Whale Health Assessment, Fernandina Beach, FL, January* - Last week saw a very successful re-start to this ongoing collaborative study of large whale health assessment. LTJG Jacob Barbaro (MMTD) is partnering with Michael Moore from Woods Hole Oceanographic Institution (WHOI) and Lisa Conger from NOAA/NEFSC to use a small, unmanned hexacopter to obtain high quality vertical images of whales for photogrammetric measurements of growth and body condition, and to collect blow samples for studies of respiratory microbiology. The hexacopter was successfully flown to collect images (Figure 1) from two female/calf pairs, and blow samples from both. Photogrammetry images will be analyzed by John Durban and colleagues in the Cetacean Health and Life History Program at SWFSC; blow samples will be analyzed by Amy Apprill's lab at WHOI. Funding support for this field



effort is provided by the NEFSC's Large Whale Team, and by SWFSC through support from the NMFS Office of Science and Technology. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov)  
**Overhead images of a mother and calf North Atlantic right whale, with bottlenose dolphins in attendance. Taken from an unmanned hexacopter >120ft above the whales. Measurements will be combined with altitude logs to estimate length and monitor calf growth, and body of the mother condition will be inferred from shape profiles. Research approach of whales using UAS was authorized by NMFS permit #17355.**

*Week of 12 December 2016*

*Green sea turtle ecological research, Seal Beach National Wildlife Refuge, 7 December 2016* – Jeff Seminoff, Camryn Allen and Joel Schumacher were joined by Dan Lawson (West Coast Regional Office) and Arthur Barranza (CSU-Long Beach) to conduct green turtle capture efforts in Seal Beach Wildlife Refuge. The team caught three juvenile green turtles, one of which was caught in the fall of 2015 at the same location. Turtles all appeared healthy, and a range of sampling was done to examine foraging habits, genetics, contaminants and hormone levels. Of the 19 turtles captured in Seal Beach since 2012, this is the second time an individual has been recaptured. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.



**Joel Schumacher and Camryn Allen landing a juvenile green turtle captured via entanglement meeting at Seal Beach NWR**

*Week of 7 November 2016*

*Green Sea Turtle Ecological Research, San Diego Bay, 2 November* – The Marine Turtle Research Programs conducted their first green turtle capture efforts in San Diego Bay since mid-August and caught an adult female weighing 124 kg. This turtle had been caught 6 times previously since 2004. Given the high number of barnacles attached to her and recent cuts and ‘mating’ scars found on her flippers and carapace (see photo), it's very likely she just returned to the bay from her nesting grounds in the Revillagigedo Islands or mainland Mexico. Blood and skin samples were collected to examine hormone levels and stable isotope values, respectively. Please contact Jeff Seminoff ([jeffrey.seminoff@noaa.gov](mailto:jeffrey.seminoff@noaa.gov)) for more information.



**A close-up of the female turtle's carapace, showing the barnacles and potential mating scars. NMFS Research Permit #18238.**

*California Sea Lion Census and Diet Research, Channel Islands, Southern California Bight, quarterly* – Molly Groskreutz and Mark Lowry will travel to San Clemente Island on November 4-7 to collect California sea lion scat samples for diet analysis and to count pinnipeds.

### Week of 24 October 2016

*Pinniped Census and Diet Studies, Southern California Bight, 20-26 October* – Beth Jaime is conducting an aerial photographic survey of California sea lions and other pinnipeds at the Channel Islands in southern California during October 20-26. The Navy (Naval Base Ventura County) is funding the chartered aircraft from Aspen Helicopters, as well as Beth's travel costs and overtime pay for the survey of the Channel Islands.

*California Sea Lion Census and Diet Research, Channel Islands, Southern California Bight, quarterly* – Alex Curtis and Kathryn Sherman will travel to San Clemente Island on October 24-27 to collect California sea lion scat samples for diet analysis and to count pinnipeds. Mark Lowry and Libby Ehlers will travel to San Nicolas Island on October 24-26 to collect California sea lion scat samples for diet analysis.

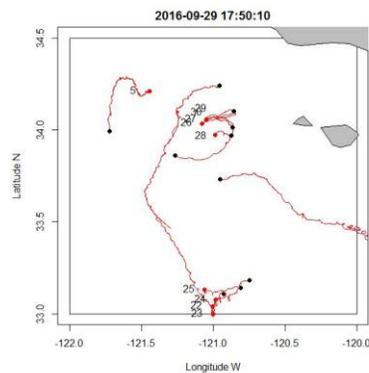
### Week of 17 October 2016

*Sea Turtle Research, Mariana Islands, 23 Oct - 1 Nov* – In collaboration with PIFSC, Camryn Allen will participate in in-water capture of foraging green and hawksbill sea turtles within the Mariana Islands (Guam, Tinian, and Saipan) from October 23 - November 1. Samples collected during this trip will add to the batch of samples (n = 32) Camryn collected earlier this year at the Mariana Islands to determine sex ratio at these foraging grounds. Camryn will also give a presentation on the use of molecular approaches to reveal climate impacts on endangered sea turtle populations at PIFSC on October 21, 2016.

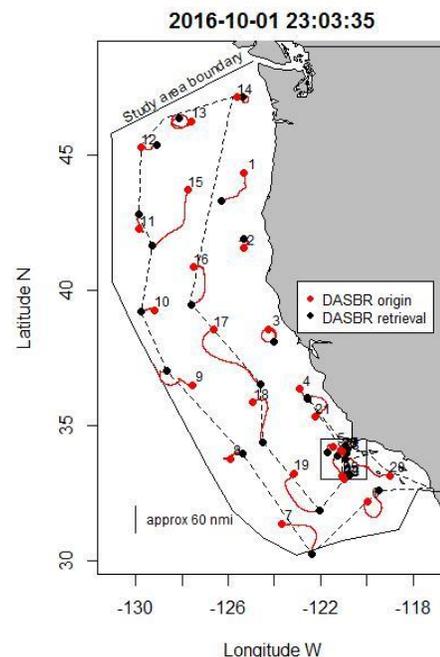
### Week of 3 October 2016

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August - 30 September* – The Passive Acoustic Survey of Cetacean Abundance Levels (the PASCAL Cruise) on the NOAA ship *Bell M. Shimada* ended on Friday, September 30, 2016. Drifting buoy recorders

(DASBRs) were deployed 30 times (see map) over the course of the 40-day survey for a total of 422 days (1.16 years) of recording time. Deployments included 20 uniformly-spaced, quasi-random locations, one re-deployment along the Big Sur coastline, and 9 deployments on or near seamounts in Southern California. All deployed equipment was recovered. In addition to the buoy recordings, the cruise collected visual and towed acoustic survey data on most days. Several groups of beaked whales were seen and acoustically detected on these transects, particularly on calm-



**Deployment (red) and recovery (black) location for 9 DASBRs deployed as a study of relative beaked whale densities in the vicinity of San Juan Seamount (#23-25) and Rodriguez Seamount (#26-30). The outline of this plot area is illustrated as a box in the other figure (near Pt. Conception). DASBR #5 was not part of this study.**



**Deployment (red) and recovery (black) location for 30 DASBRs deployed during the PASCAL cruise. Red lines show the drift of the DASBRs. Black dotted line shows approximate route of the ship on Leg 3.**

weather days. Dolphin and whale sightings and acoustic detections were common on most days. The last survey leg was led by Jay Barlow and included Jennifer Keating and Eric Keen as acoustic technicians and Bob Pitman, Eric Archer, and Colette Cairns (from NMFS' Office of Protected Resources) as visual observers. Annette Henry, Survey Coordinator, lead the unloading effort on Friday. Acoustic data from the DASBRs will be analyzed over the course of the next year and are expected to provide much more precise estimates of beaked whale and sperm whale abundance than provided by previous visual survey. This study was funded in part by the U.S. Department of the Interior, Bureau of Ocean Energy Management through Interagency Agreement M16PG00011 with the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center. Additional funding was provided by Southwest Fisheries Science Center. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) and [Jeff.E.Moore@noaa.gov](mailto:Jeff.E.Moore@noaa.gov) and see the survey website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=21732> for more information.

*Leatherback Turtle Feeding Ecology Research, Monterey Bay, CA, 28 August – 1 October* – The 2016 leatherback turtle sampling effort finished strong last week during two consecutive capture/tagging days with exceptional weather conditions off San Francisco, CA. Patience was rewarded as the team captured five adult/sub-adult leatherbacks for sampling and tagging, and deployed ‘TurtleCam’ cameras on three to obtain video footage of foraging behavior (see top photo). Among the seven leatherbacks captured during the 2016 season, two had PIT tags from western Pacific nesting beaches. Five of the seven turtles have continued apparent foraging behavior in the area where they were captured, while two have left coastal waters to initiate their seasonal southwestward migration. Between capture/tagging operations, the aerial team completed additional fine-scale surveys to obtain leatherback density data within the 10 x 15 nmi foraging patch. Aerial field efforts concluded on 1 Oct with a final survey between Monterey Bay and Humboldt County, CA, which confirmed that the only apparent turtle foraging region was within the sampled area. This project was supported by a NOAA Stock Assessment Improvement Plan award to NOAA’s Southwest Fisheries Science Center, as well as NOAA’s Aircraft Operations Center (AOC) and Moss Landing Marine Laboratories. We thank all for their outstanding support. Research was conducted under NMFS Permit 15634. Please contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.



**Photos: Top: Still photo from TurtleCam footage of leatherback approaching a brown sea nettle for consumption. Middle: Turtle capture/tagging team on 9/26/2016 aboard the MLML vessel *Sheila B*: Tomo Eguchi, Jeff Seminoff, Heather Harris, Jim Harvey, Scott Benson. Bottom: Aerial survey and spotting team: LT Rob Mitchell, Katherine Whitaker, Lia Komoroske, Joel Schumacher, Karin Forney, and LTJG Rick DeTriquet [Additional SWFSC participants not shown: Erin La Casella, Camryn Allen, Peter Dutton]**

*Week of 26 September 2016*

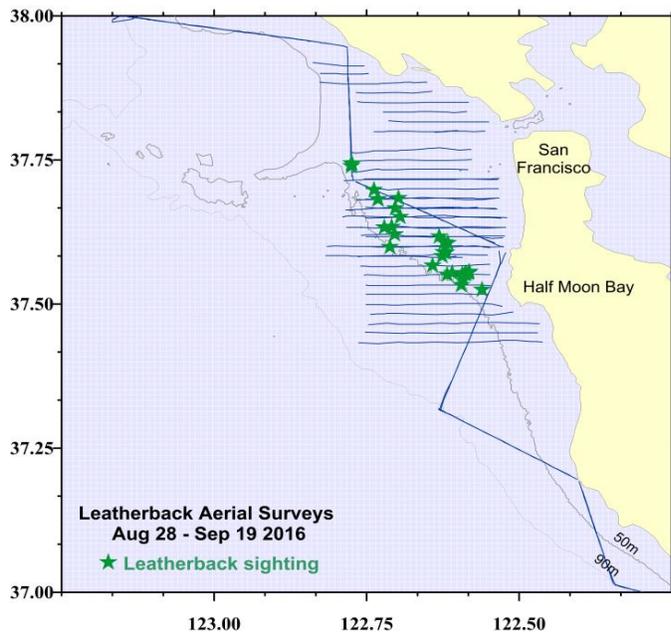
*Whale Health & Condition Assessment, Vancouver Island, August - September* – Fieldwork concluded this past week for this project using an unmanned hexacopter for remote health assessment of killer whales and humpback whales. Forty-eight additional hexacopter flights were successfully completed, contributing to a total of 258 flights over the past two months in the coastal waters of Washington State and British Columbia. Vertical images have been collected from all killer whales sighted, including all 82 members of the endangered Southern Resident population, 40 individuals from the neighboring Northern Resident killer whale population and 27 Bigg’s (“Transient”) killer whales. These images will be used in comparative photogrammetry analyses of growth and body condition. Additionally, vertical images have been obtained from 20 humpback whales, coupled with 12 blow samples that were collected using the hexacopter. The vertical images will be used to assess body condition and the blow samples will be analyzed for respiratory pathogens, to contribute to ongoing comparative health assessment of humpback whales in different stocks and contrasting feeding habitats. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**An adult male Southern Resident killer whale (“L85”) approaches the Vancouver Aquarium’s research boat when shut down and stationary for hexacopter retrieval. Onboard are the MMTD research team of John Durban (piloting hexacopter) and Holly Fearnbach (catching hexacopter), with collaborator Lance Barrett-Lennard (Vancouver Aquarium) taking identification photographs. Photograph courtesy of Sara Shimazu. Research approaches and hexacopter flights over whales were authorized by NMFS permit 19091 and airspace clearance by the FAA (2015-ESA-200-COA).**

*Leatherback Turtle Feeding Ecology Research, Monterey Bay, CA, 28 August - 30 September* – With improving weather conditions, the leatherback team returned by boat and plane to the area off Half Moon Bay, CA, where three leatherbacks were sighted during the previous week’s aerial survey. The aerial team (Karin Forney, Camryn Allen, Joel Schumacher, Katherine Whitaker, and pilots Rob Mitchell and Rick DeTriquet aboard the NOAA Twin Otter N57RF) completed fine-scale surveys and located multiple leatherbacks for in-water ‘Turtle-cam’ deployments and capture/tagging operations. The vessel-based team (Scott Benson, Tomo Eguchi, Heather Harris, Lisa Komoroske, and Moss Landing Marine Laboratories’ Capt. John Douglas and Jackson Winn aboard RV *Sheila B*) deployed suction cup-attached cameras and time-depth recorders on three different turtles for about 20-60 minutes each. The obtained video and data record provide detailed data on leatherback foraging behavior and leatherback prey. Two leatherback turtles were successfully captured and outfitted with satellite-linked transmitters to monitor movements within the foraging grounds and during their seasonal migration. Field efforts will continue

through the end of the month, as weather conditions permit. Please contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.

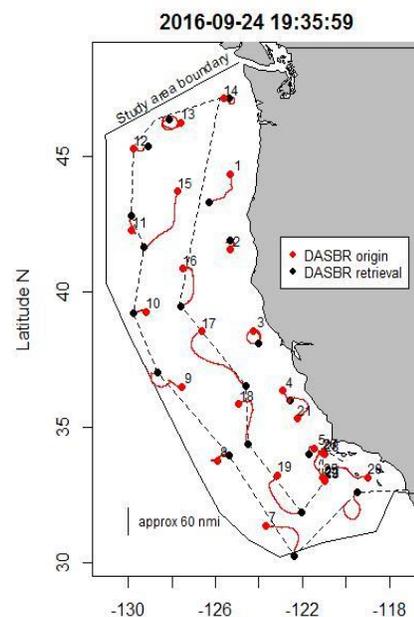


Left: Completed aerial survey transects (blue lines) and locations of leatherback turtle sightings to date. Right: Aerial view of the leatherback capture operations (Photo: Joel Schumacher). Research authorized under permit #15634.

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August - 30 September* – Over the past week, the PASCAL cruise aboard the NOAA R/V *Bell Shimada* has been traveling south from Washington to southern California, picking up DASBR recorders #16, 17, 18, and 19 (see map). Only three of the original buoy recorders (deployed on the first two legs) remain to be recovered. All except one (which malfunctioned) contained a wealth of acoustic data. Preliminary scans of the data show many beaked whale, sperm whale, and dolphin detections. Unfortunately, the weather over the past week has not been conducive to visual surveys. In fact, the 20+ kts winds have prevented us from towing the hydrophone array on several days. The ship's crew and their skill with grappling hooks has been a vital part of our success in recovering buoys in rough seas. A new experiment to see if beaked whales are concentrated over seamounts off southern California was initiated this past week. Two DASBRs on San Juan Seamount and one "control" buoy about 6 miles away were deployed this past Friday. On Saturday, the same deployments were made on Rodriquez Seamount. These data will complement a San Juan Seamount



Ship's crew using grappling hooks to recover a DASBR buoy recorder at night. The pole of the DASBR and the associated float are illuminated by reflective tape which can be seen at 1/2-mile range using the ship's spotlight.



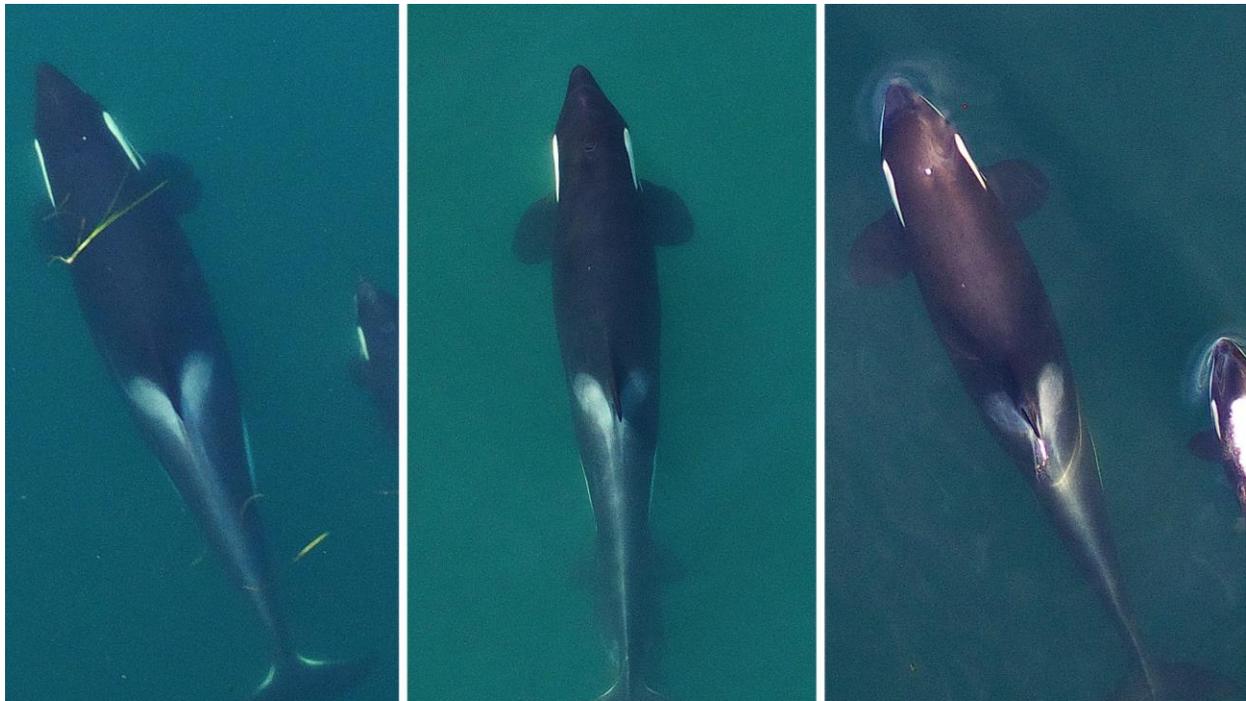
Locations of PASCAL DASBR deployment and retrieval locations, and buoy drifts through 24 Sep 2016.

On Saturday, the same deployments were made on Rodriquez Seamount. These data will complement a San Juan Seamount

deployment that was done on Leg 2. We will return to pick up these buoys (and other remaining buoys) in a few days, after we return from a trip north to retrieve a DASBR off Carmel. These data will allow us to determine whether the density and species composition of beaked whales on seamounts is different from surrounding waters. Weather is expected to improve early next week, and we hope to conduct visual and towed hydrophone surveys of the seamounts as well. The PASCAL cruise will end on Friday, September 30. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) and [Jeff.E.Moore@noaa.gov](mailto:Jeff.E.Moore@noaa.gov) and see the survey website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=21732> for more information.

### *Week of 19 September 2016*

*Whale Health & Condition Assessment, Vancouver Island, August - September* – Last week (week 6 of this season’s product) was another productive one around the San Juan Islands, Washington State. A total of 32 hexacopter flights were successfully completed, increasing our sample coverage of vertical images to 75 of 82 individuals in the endangered population of Southern Resident killer whales. These images of uniquely recognizable individuals are enabling photogrammetry comparisons of growth and body condition across years and between seasons (see Figure). Vertical images were also collected from a single humpback whale (16 humpbacks in total). The flight team of John Durban, Holly Fearnbach (SWFSC) and Lance Barrett-Lennard (Vancouver Aquarium) were joined in the field for a day by Mike Ford, the director of the Conservation Biology Program at NOAA/NWFSC. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.



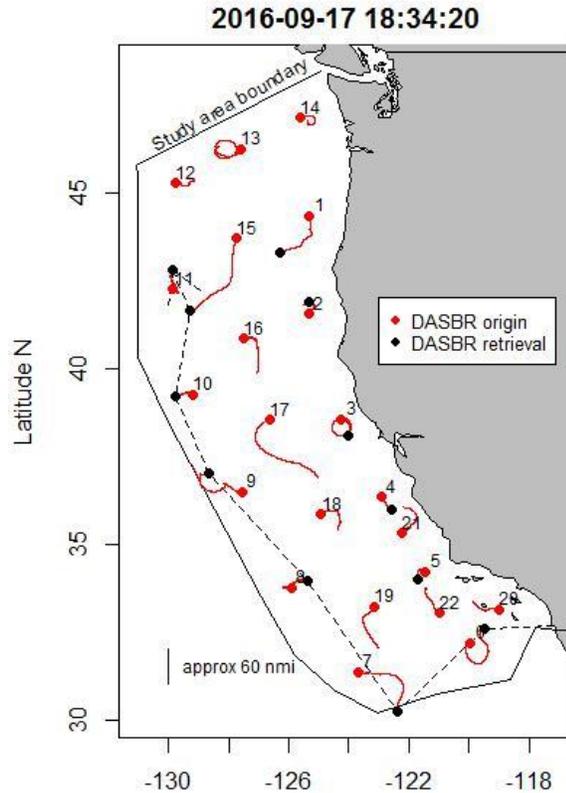
Vertical images of “J36”, a 17-year old reproductive female from the endangered Southern Resident killer whale population. This graphically displays how we are using vertical images to assess changes in condition (width profiles) across years and seasons; J36 was notably lean in May compared to the September images, and photogrammetry measurements are underway to quantify these changes. Images taken using an unmanned hexacopter at an altitude of >100ft, research approaches authorized by NMFS permits 16163 & 19091 and airspace clearance by the FAA (2015-ESA-200-COA).

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August - 30 September* – Seven recording buoys (DASBRs) were recovered during the first week of Leg 3 of the PASCAL survey. All but one of the retrievals occurred during the night. Most of the flashing lights failed

on these buoys (flooded), but the crew was very adept at finding their reflective tape with spotlights. Expert grappling by the ship's crew recovered the buoys on the first pass. All of the DASBRs recorded the expected amount of data, but two ended their recordings early because they were recording nearly continuously rather than on their programmed duty cycle. A preliminary review of data collected on the two southern offshore DASBRs showed an average of more than one beaked whale detected per day and included two detections of Kogia (the first for our DASBRs) and several sperm whales.

In contrast, the visual and towed acoustic results have been disappointing. The only identified sightings include striped dolphins, common dolphins and a blue whale. The towed array added sperm whales to this list. Despite searching an average of 11+ hours per day, the results have been meager. Weather has not been cooperative, with lots of Beaufort 4/5, and only one day of Beaufort 2/3. The beaked whales are apparently waiting for beaked whale weather to show. We expect to collect the final three northern DASBRs in the next few days and to turn the corner for the southward leg of our journey. If we can stay ahead of schedule, we hope to search for beaked whales wherever we can find calmer seas. Contact: [Jeff Moore](#) and [Jay Barlow](#), co-Chief Scientists and see the survey website

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=21732> for more information.



Locations of PASCAL DASBR deployment and retrieval locations, and buoy drifts through 17 Sep 2016.

Contact: [Jeff Moore](#) and [Jay Barlow](#), co-Chief Scientists and

see the survey website

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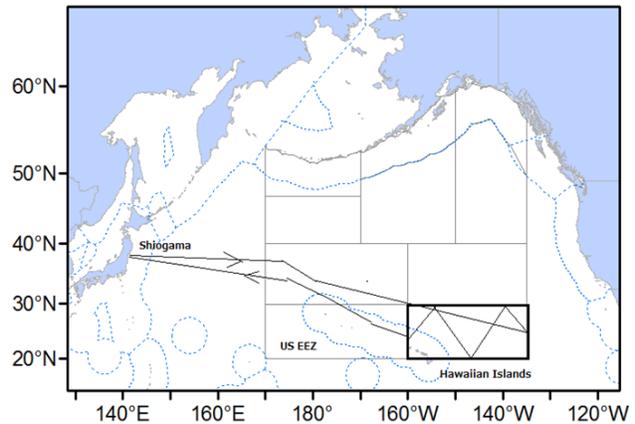
*Leatherback Turtle Feeding Ecology Research, Monterey Bay, CA, 28 August - 30 September* – Low clouds and wind have continued to hamper field efforts, but this week there was a 1-day break in the weather on September 14, and the leatherback team successfully completed a survey of nearshore waters between Monterey Bay and Cape Blanco Oregon. Three leatherbacks were seen off San Francisco in a patch of their primary jellyfish prey species (the brown sea nettle, *Chrysaora fuscescens*). Off northern California and Oregon, some additional regions with patchy egg yolk jellies (*Phacellophora camtschatica*) and purple-striped jellies (*Chrysaora colorata*) were observed, but no leatherbacks were seen. Jeff Seminoff and Peter Dutto will join the team on 21 Sept. Field efforts will continue through the end of the month, as weather conditions permit. Please contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional



**Left: Scott Benson conducting observations for leatherback turtles and marine mammals from the belly window of NOAA Twin Otter N57RF; Right: Cape Blanco, Oregon – the northernmost point for the survey.**

information.

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, 2 July – 30 August* – Final report from SWFSC, MMTD biologist Jim Gilpatrick. The survey was conducted aboard the Japanese *R/V Yushin-maru no.3* in the Central North Pacific as a cooperative oceanic cetacean survey effort between the International Whaling Commission, NOAA Fisheries, and Fisheries Agencies in Japan. Pelagic seabirds and marine debris were also identified, photographed and recorded. A total of 3,444 nautical miles of track-line were surveyed during the 60-day effort. Marine mammal sightings included: 1 Central North Pacific blue whale, 1 sei whale, 32 Bryde’s whales, 32 sperm whale pods, 5 Cuvier’s and 3 *Mesoplodon spp.* beaked whales, 2 short-finned pilot whale schools, 1 school of pygmy killer whales, 2 Risso’s dolphin schools, 1 school of bottlenose dolphins, 8 common dolphin schools, 5 striped dolphin schools, and 1 school of pan-tropical spotted dolphins. Photographs were cataloged (nearly 2,400 cetacean photos taken) for most sightings and 23 biopsy (skin/blubber) samples were collected from: 1 blue whale, 1 sei whale, 16 Bryde’s and 5 sperm whales. Biopsy samples will be used in ongoing cetacean population genetics studies; analyses will be conducted by MMTD-SWFSC scientists and at the genetics lab at The National Research Institute of Far Seas Fisheries

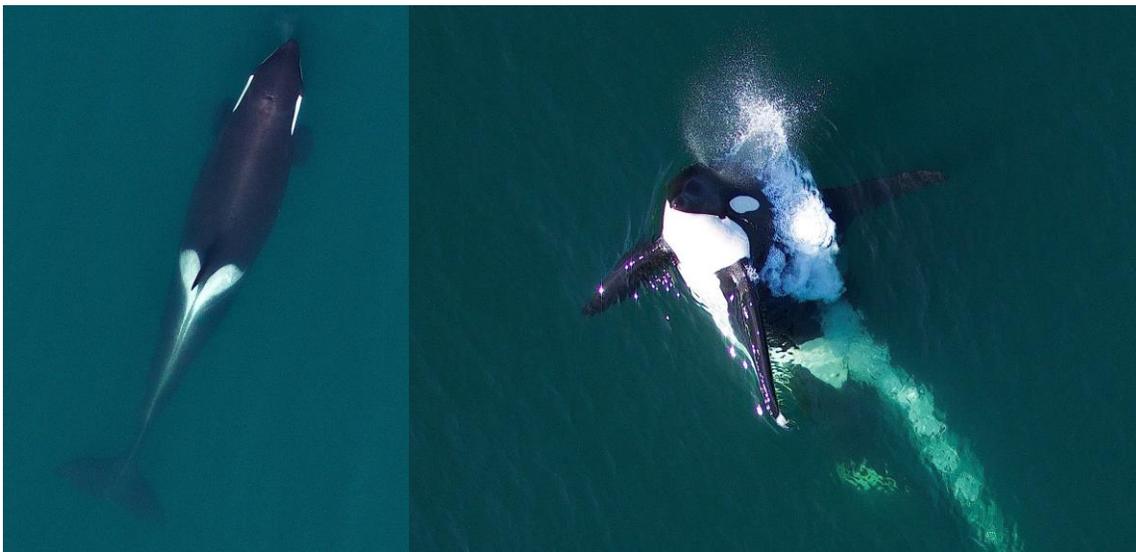


**Research area, transit and survey track lines for the 2016 IWC-POWER cruise.**

(NRIFSF) in Shizuoka Prefecture, Japan. Numerous oceanic seabirds were sighted, identified and photographed (some 1,700 seabird photographs were cataloged with meta-data). The *R/V Yushin-maru no.3* returned to the Port of Shiogama, Miyagi Prefecture on 30-Aug.-2016. On 31-August, Gilpatrick met with Professor Hidehero Kato and his staff and graduate students at the Tokyo University School of Marine Science and Technology. Discussions centered around the status of large whale populations in the North Pacific and future cetacean ship-based surveys out of Japan and the NOAA, Southwest Fisheries Center. Gilpatrick returned to La Jolla on 2-September. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

### *Week of 12 September 2016*

*Whale Health & Condition Assessment, Vancouver Island, August - September* – This past week was an extremely productive one around the San Juan Islands, Washington State. A total of 48 hexacopter flights were successfully completed, collecting vertical photogrammetry images of 70 different Southern Resident killer whales from a population currently numbering 82 individuals. Image measurements will be compared to hexacopter photogrammetry from 2015 and earlier in 2016, and helicopter photogrammetry from 2008 and 2013 to examine growth and changes in condition of individuals in this endangered population. Matching vertical images (condition) and blow samples (respiratory pathogens) were also collected from two humpback whales, to add to 15 whales imaged in neighboring British Columbia in August. The hexacopter flight team of John Durban and Holly Fearnbach also presented a public lecture at The Whale Museum in Friday Harbor on the use of UAS technology for whale health assessment, specifically focusing on endangered Southern Resident killer whales. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.



Vertical images of endangered Southern Resident killer whales. Left: aerial photograph of “J2” - an iconic, post-reproductive Southern Resident killer whale female, estimated to be >100yrs old and the oldest member of the this endangered population. Right, photograph of “J27”, a 25-yr old adult male, about to breach clear of the water. Images taken using an unmanned hexacopter at an altitude of >100ft above the whales, with research approaches authorized by NMFS permit # 19091 and airspace clearance by the FAA (2015-ESA-200-COA).

*Leatherback Turtle Feeding Ecology Research, Monterey Bay, CA, 28 August – 30 September* - The 2016 field effort remained suspended last week due to unfavorable weather and sighting conditions. Low clouds and fog are forecast through the first half of this week. The survey and in-water capture effort

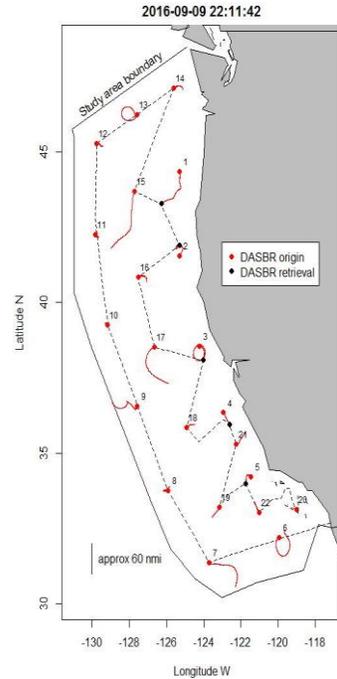
will resume when the weather improves. Please contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.

**Figure: Locations of PASCAL DASBR deployment locations (Legs 1&2), retrieval locations (Leg 2), and buoy drifts through 9 Sep 2016.**

*Passive Acoustic Survey of Cetacean Abundance*

*Levels (PASCAL), California Current, 19 August - 30*

*September* – The third and final leg of the SWFSC PASCAL cruise began on Sunday, Sep. 11. The continuing survey crew, Bob Pitman and Jennifer Keating, were joined by Jay Barlow (co-chief scientist), Eric Archer, Eric Keen, and Colette Cairns (from NMFS HQ). The goal of the third leg is to pick up the 17 drifting acoustic spar buoy recorders (DASBRs) that were deployed during Legs 1 and 2, and to conduct visual and towed acoustic surveys of cetaceans between DASBR retrieval stations. During Leg 3 we hope to obtain visual identifications of beaked whale species and to link those species to the sounds that they make. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) or [Jeff.E.Moore@noaa.gov](mailto:Jeff.E.Moore@noaa.gov) for more information.



*Week of 6 September 2016*

*Whale Health & Condition Assessment, Vancouver Island, August - September* – This past weekend field operations moved from British Columbia to Washington State waters around the San Juan Islands, to primarily assess the body condition and health of endangered Southern Resident killer whales (SRKWs). John Durban, Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) successfully completed 25 hexacopter flights in the first two days of the project, obtaining photogrammetry images from 34 different SRKWs, including members of all three pods (“J”, “K” and “L”). Photogrammetry measurements will be used to assess growth and changes body condition of individual SRKWs that were also imaged in in 2008, 2013, 2015 and May 2016, and also to compare to similar measurements from Northern Resident killer whales in Canada (sampled in 2014, 2015 and 2016). This comparison across years and populations will enable an analysis of growth and condition relative to changes in the availability of Chinook salmon, their primary prey (see podcast for more information: [http://www.fisheries.noaa.gov/podcasts/2015/10/uav\\_killer\\_whale.html](http://www.fisheries.noaa.gov/podcasts/2015/10/uav_killer_whale.html)). The team was also joined in the field by Don LeRoi (Aerial Imaging Solutions) to successfully test and adopt hexacopter equipment upgrades. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).

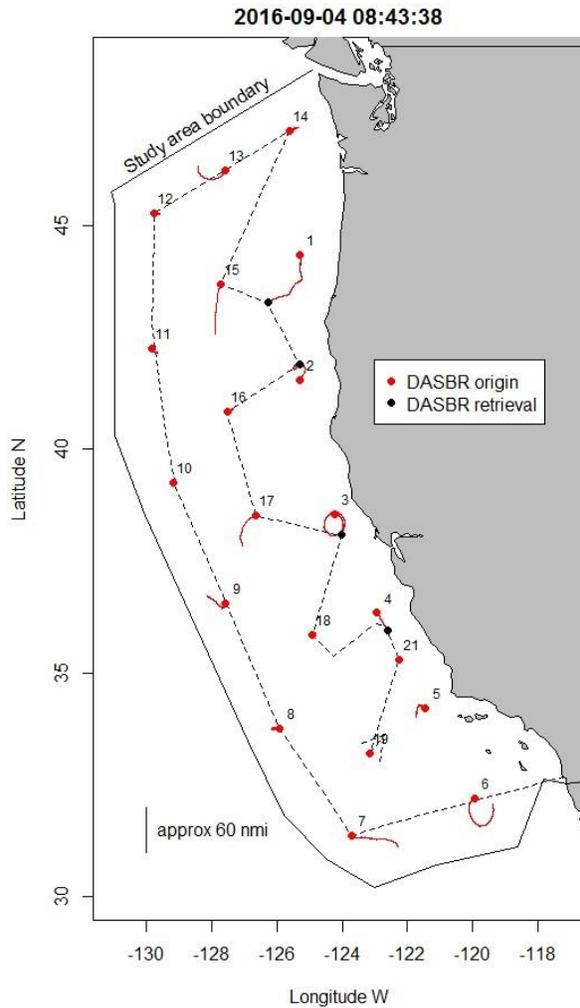


**Adult female Southern Resident killer whales in contrasting body condition. Left: a 39-year old adult female (K14) in relatively robust condition - note the salmon in mouth. Right: a very lean adult female (J28, 23 years old) with first year dependent calf (J54, also lean). Image taken using an unmanned hexacopter at an altitude of >100ft above the whales, with research approaches authorized by NMFS permit # 19091 and airspace clearance by the FAA (2015-ESA-200-COA).**

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August - 30 September*  
 – Leg 2 of PASCAL, conducted aboard the NOAA ship *Bell M Shimada*, will be completed this week, on Wednesday, 7 September. The five drifting acoustic spar



**DASBR about to be grappled for retrieval**



**Leg 2 progress (dotted line) and DASBRs deployed and retrieved on Legs 1 and 2 as of September 4**

buoy recorders (DASBRs) that were deployed during Leg 1 have been retrieved, and an additional 17 DASBRs, to be retrieved on Leg 3, have been deployed. Towed hydrophone arrays have made several beaked whale detections, and we visually search for beaked whales when conditions allow. On two occasions, visual and acoustic detections of *Mesoplodon* beaked whales were matched, but neither were identified to species. Other sightings of note included two sperm whale groups (a pair, and a group of 7+, including a calf). An unexpected highlight was a Nazca booby! There are only a handful of records of this species in the USA.



**Nazca booby. Photo: Greg Sanders**

*The objective of this survey is to collect data from a network of 20 drifting acoustic spar buoy recorders (DASBRs), which should allow us obtain new and improved density and abundance estimates for the focal study species: beaked whales (family Ziphiidae), sperm whales, and dwarf and pygmy sperm whales. We are also towing a hydrophone array between deployment and retrieval stations to gather additional data on the geographic and depth distribution of beaked whales and to visually validate species identification for some beaked whale acoustic signals. This is truly an unprecedented opportunity to collect data on these cryptic species for which NOAA stock assessments contain relatively little information. PASCAL is being funded in part by the Bureau of Ocean Energy Management (BOEM). Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) or [Jeff.E.Moore@noaa.gov](mailto:Jeff.E.Moore@noaa.gov) for more information.*

*Leatherback Turtle Feeding Ecology Research, Monterey Bay, CA, 28 August – 30 September – The 2016 field effort was suspended last week due to strong and persistent northwest winds. The unfavorable*

weather is expected to continue this week. The survey and in-water capture effort will resume when the weather improves. Please contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.

*Week of 29 August 2016*

*Whale Health & Condition Assessment, Vancouver Island, August - September* – Last week was a very successful one, with 45 hexacopter flights successfully completed (cumulative 105 flights over three weeks for the Canadian leg of this study). During these flights, photogrammetry images were collected from 40 individual Northern Resident killer whales. All of these individuals, except three new calves, were also imaged in both 2014 and 2015, which will enable a comparison of body condition across years relative to changes in the availability of Chinook salmon, their primary prey. Photogrammetry images were also collected from 9 different humpback whales (15 to date this year), along with five more blow samples (9 in total) to examine respiratory pathogens. This week the research team of John Durban, Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) will move operations to Washington State to assess the comparative body condition of endangered Southern Resident killer whales. Further photogrammetry images and blow samples will also be opportunistically collected from humpback whales to contribute to our comparative health assessment of humpbacks in different stocks and contrasting feeding habitats. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Left: Photogrammetry image of an adult female Northern Resident killer whale with a newborn calf. Right: the head of a humpback whale photographed during a descent to collect a blow sample with the hexacopter – note the open blowholes during exhalation. Images collected using an unmanned hexacopter, permitted in Canada under the Species at Risk Act (Marine Mammal License 18) and flight authorizations from Transport Canada (SFOC # 11939499)**

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August - 30 September* – The focal study species of this survey are beaked whales (family *Ziphiidae*), sperm whales, and dwarf and pygmy sperm whales. Data are being collected from a network of drifting acoustic spar buoy recorders (DASBRs), which should allow us to obtain new and improved density and abundance estimates for these groups. A towed hydrophone array will provide additional data on the geographic and depth distribution of beaked whales and visual observations will validate species identification. This is truly an unprecedented opportunity to collect data on these cryptic species for which NOAA stock assessments contain relatively little information.

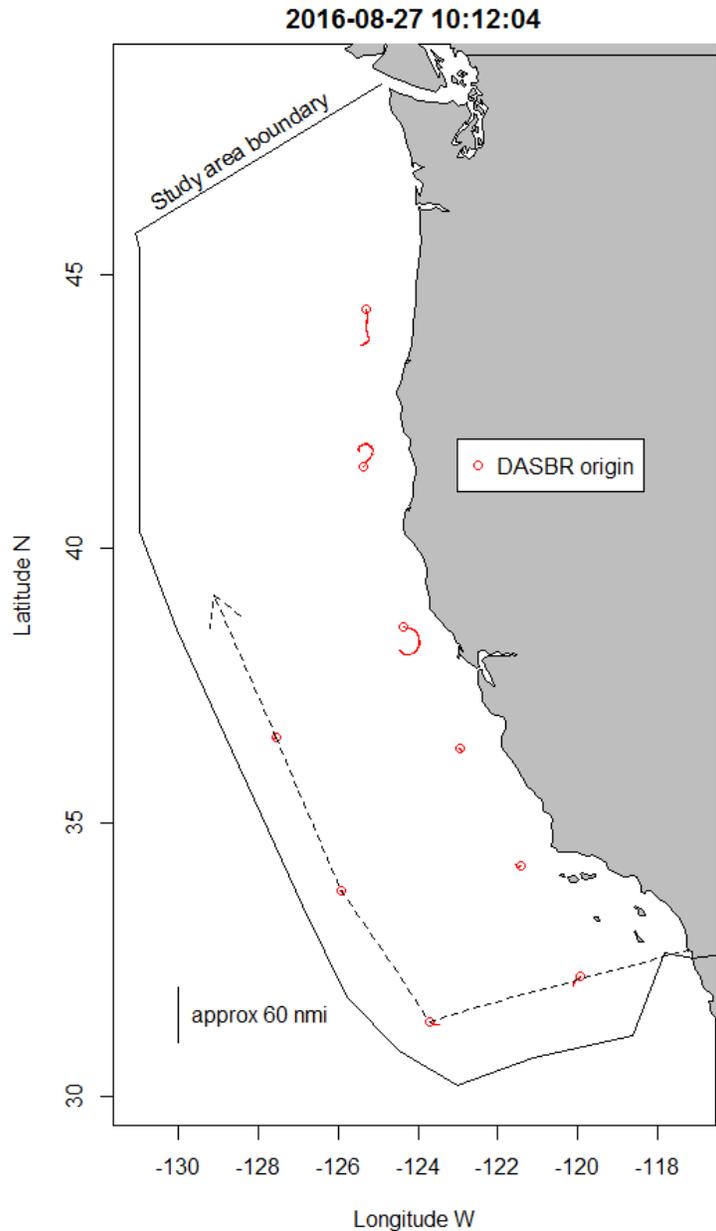


From left: Ashlyn Giddings (SIO), Jennifer Keating (SWFSC) and Karin Forney

Leg 1 is complete: Shannon Rankin deployed five drifting acoustic spar buoy recorders (DASBRs) from the NOAA ship *Bell M Shimada* during its transit from Newport to San Diego.

Leg 2 is currently under way, led by Jeff Moore. To date, an additional 5 DASBRs have been deployed and another 10 will be deployed this week. A new array (called *Trident*) is being towed at 10 knots, substantially faster than any prior tetrahedral array, so the survey is already yielding some new successes. A skeleton crew of visual observers has so far detected blue whales, fin whales, short-beaked common dolphins, striped dolphins, Risso's dolphins and offshore bottlenose dolphins. At this writing, no beaked whales have yet been detected. PASCAL is being funded in part by the Bureau of Ocean Energy Management (BOEM). More info about PASCAL can be found here: <https://swfsc.noaa.gov/textblock.aspx?id=21732&ParentMenuId=259>

*Behavioral Response of Cetaceans to Navy Sonar, Southern California Bight, August* - Last week, Jay Barlow participated in this Navy-sponsored, multi-institutional study. Jay was operating a towed



Leg 2 progress (dotted line) and DASBRs deployed on Legs 1 and 2 as of Aug 27 morning (lines show their drift)

hydrophone array using a 30-ft Navy Interceptor vessel operating off San Clemente Island. He was aided by Katy Laveck from Cascadia Research Collective. A Navy ship with a 53-type sonar and Navy helicopters with dipping sonar systems were available for experimental playback trials. The team did not find any beaked whales on this trip, but did locate several groups of Risso's dolphins, both acoustically and visually. Unfortunately, the tagging vessels were not successful in tagging any cetaceans at times when Navy sonar was available for an experiment. We did, however, witness a killer whale attack on a Risso's dolphin. A large male killer whale rammed the dolphin in the side and disabled it. No blood was seen in the water, so it is not clear if they ate it or whether the dolphin died of its injuries. Jay was aided with shore-side support from Jennifer Keating and Annette Henry.

*Leatherback Turtle Feeding Ecology Research, Monterey Bay, CA, 28 August – 30 September* - The 2016 field season began this past weekend. The aerial team onboard a NOAA de Havilland Twin Otter was able to seize a brief and narrow weather window on the afternoon of 28 August, and surveyed transects between Monterey Bay and the Sonoma coast with very good sighting conditions. Although just a few egg yolk jellies were encountered, one leatherback turtle was found directly west of the Golden Gate Bridge (in the shipping lane). Multiple large *Mola mola* were found off the San Mateo coast in an area that has traditionally been favorable for leatherbacks. Although a few whales were sighted in Monterey Bay, no turtles or jellies were sighted. Unfortunately, the weather forecast for next week is not favorable for aerial surveys or in-water sampling. Unusually strong winds for this time of year are expected for about a week. The survey and in-water capture effort will continue when the weather improves. Please contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.

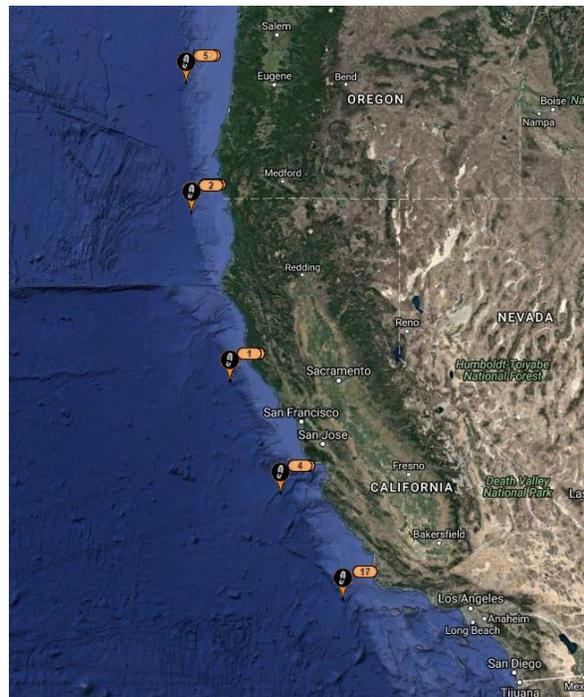
### *Week of 22 August 2016*

*Whale Health & Condition Assessment, Vancouver Island, August - September* – This week 43 hexacopter flights were successfully completed and photogrammetry images were collected from 22 killer whales, comprising 20 Northern Residents and 22 Bigg's killer whales. The images from Bigg's killer whales (mammal-eaters, formerly known as "Transients") will provide a key comparison in body condition and length-at-age relationships to the salmon-eating Residents, notable because Bigg's killer whales have been increasing rapidly in abundance in this area over the last four decades and are apparently healthy. Photogrammetry images were also collected from 11 different humpback whales, along with four blow samples to examine respiratory pathogens. The research team of John Durban, Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) also gave a presentation about this ongoing research at the Telegraph Cove Whale Interpretive Center. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Left: Photogrammetry image of an adult female humpback whale (measured at 48ft) and calf (28ft). Right: A juvenile Northern Resident killer whale swims with Pacific white-sided dolphins, which regularly try to steal salmon from feeding killer whales. Images collected using an unmanned hexacopter at altitudes of >100ft above the whales, permitted in Canada under the Species at Risk Act (Marine Mammal License 18) and flight authorizations from Transport Canada (SFOC # 11939499).**

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August – 30 September* – PASCAL began last Friday as the *R/V Bell Shimada* left Newport Oregon. Shannon Rankin, Cruise Leader, has deployed four of 20 drifting acoustic spar buoy recorders (DASBRs) while en route to San Diego (see Figure). The fifth is expected to be deployed today off Point Conception. Robert Holland is also aboard and is setting up the computer systems for Leg 2 of PASCAL which will begin on Tuesday, August 23 after the remainder of the gear and personnel are loaded. PASCAL is being funded in part by the Bureau of Ocean Energy Management (BOEM). Contact [Jeff.E.Moore@noaa.gov](mailto:Jeff.E.Moore@noaa.gov) and [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) and see the project website for more information:



<https://swfsc.noaa.gov/textblock.aspx?id=21732&ParentMenuId=259>

*Behavioral Response of Cetaceans to Navy Sonar, Southern California Bight, August* - Jay Barlow is working from a Navy Interceptor vessel this week based out of San Clemente Island, as part of a larger Navy-funded study. Jay will use passive acoustics (a towed hydrophone) to find beaked whales, sperm whales, and Risso's dolphins for tagging and sonar-playback studies. In addition to the Navy, collaborators include Cascadia Research, Southall Associates, and the University of St. Andrews. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August – Weekly Report #7 from SWFSC, MMTD Biologist Jim Gilpatrick aboard the Japanese R/V Yushin-maru no.3 (YS3). Our research survey is a cooperative oceanic cetacean survey effort between the International Whaling Commission, NOAA Fisheries and Fisheries Agencies in Japan. A total of 680 nmi of transit line were surveyed last week for marine mammals, seabirds and marine debris. Marine mammal sightings included 22 Sperm Whale (*Physeter macrocephalus*) groups; 2 Cuvier's beaked whales (*Ziphius cavirostris*); 1 *Mesoplodon spp*; 2 Short-Fin Pilot whale (*Globicephalus macrorhynchus*) groups and 1 school of striped dolphins (*Stenella coeruleoalba*). Photographs were collected for all sightings except for the quick-diving *Mesoplodon spp*, and biopsy samples were collected from Bryde's and Sperm whales. Seabirds included Brown, Red-Footed and Masked booby, White- and Red-tailed tropicbird, Great Frigatebird, Hawaiian and Juan Fernandez petrel, Wilson's Storm Petrel, Brown Noddy, Sooty and White tern, Wedge-Tailed Shearwater and an Arctic Skua. Shorebirds included multiple Pacific Golden Plovers and a solitary Cattle Egret. A high points of the week was a fast-moving, feeding (preying on flying squid and small fishes) school of Skipjack and Yellowfin tuna with several hundred diving and feeding seabirds including Sooty Terns, Wedge-Tailed Shearwaters, Boobies and Magnificent Frigatebirds. The YS3 is now transiting and surveying in "passing mode" towards the coast of Japan on a WNW course of 289°. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.*

### *Week of 15 August 2016*

*Whale Health & Condition Assessment, Vancouver Island, August - September – This week fieldwork resumed on the collaborative project undertaking whale health assessment off Vancouver Island. The research team of John Durban and Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver*



**Left: Photogrammetry image of part of the A30 matriline of Northern Resident killer whales; these whales were also imaged in 2014 and 2015, enabling a comparison of body condition across years. Right: Photogrammetry image of a humpback whale, which will be used to compare body condition and health for this species in different feeding areas. Images collected using an unmanned hexacopter at altitudes of >100ft above the whales, permitted in Canada under the Species at Risk Act (Marine Mammal License 18) and flight authorizations from Transport Canada (SFOC # 11939499).**

Aquarium) completed 17 flights with an unmanned hexacopter, obtaining photogrammetry images from 16 Northern Resident killer whales and two humpback whales of northern Vancouver Island, Canada. These images will be used to infer the nutritional status and reproductive success of Northern Resident killer whales, relative to the abundance of their preferred prey (Chinook salmon). This will build on photogrammetry studies of this population since 2014 to provide a key comparison to the status of endangered Southern Resident killer whales, which will be measured during follow-on studies this coming September on the U.S. side of the border around southern Vancouver Island. The images of humpback whales will contribute to ongoing health comparisons for this species on different feeding grounds, ranging from pristine (e.g., around Antarctica) to relatively urban (e.g., off Massachusetts), in collaboration with colleagues at Woods Hole Oceanographic Institution. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).

*Passive Acoustic Survey of Cetacean Abundance Levels (PASCAL), California Current, 19 August – 30 September* – PASCAL is a dedicated acoustic survey for cetaceans throughout the U.S. portion of the California Current. Focal study species are beaked whales (family Ziphiidae), sperm whales, and dwarf and pygmy sperm whales. Data will be collected from a network of 20 drifting acoustic spar buoy recorders (DASBRs), which will be deployed during legs 1 and 2 of study and retrieved during legs 2 and 3. These should allow us obtain new and improved density and abundance estimates for these groups. We will also tow a hydrophone array between deployment and retrieval stations to gather additional data on the geographic and depth distribution of beaked whales and to visually validate species identification for some beaked whale acoustic signals. This is truly an unprecedented opportunity to collect data on these cryptic species for which NOAA stock assessments contain relatively little information. PASCAL will be conducted from the NOAA research vessel *Bell M. Shimada*. Leg 1 departs on 8/19 from Newport, Oregon, and will be led by Shannon Rankin. Legs 2 and 3 depart 8/23 and 9/11, from San Diego and will be led by Jeff Moore and Jay Barlow, respectively. Jennifer Keating is the lead acoustician. SWFSC scientists Bob Pitman, Karin Forney and Eric Archer will participate as visual observers. SIO grad students Eric Keen, AJ Schlenger and Ashlyn Giddings will also participate. Annette Henry is the Survey Coordinator. PASCAL is being funded in part by the Bureau of Ocean Energy Management (BOEM). Contact [Jeff.E.Moore@noaa.gov](mailto:Jeff.E.Moore@noaa.gov) and [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) and see the project website for more information: <https://swfsc.noaa.gov/textblock.aspx?id=21732&ParentMenuId=259>

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August* – Weekly Report #6 from SWFSC, MMTD biologist Jim Gilpatrick aboard the Japanese R/V *Yushin-maru no.3* - Our research survey is a cooperative oceanic cetacean survey effort between the International Whaling Commission, NOAA Fisheries, and Fisheries Agencies in Japan. This past week 495 nmi were surveyed for marine mammals, seabirds and marine debris. The ship is approx. 180 nmi north of the Hawaiian Island of Kauai with current course to the S/SW at 11.5 kts. Tropical storm weather systems continue to influence research operations with scattered rain squalls, winds up to 25 kts, rough seas and swells up to 4.0 meters. Marine mammal sightings included two Sperm Whale (*Physeter macrocephalus*) groups (photographs and biopsy samples collected from both), two Cuvier's beaked whales (*Ziphius cavirostris*) and a school of striped dolphins (*Stenella coeruleoalba*), also photographed. Brown Boobies, White- and Red-tailed Tropicbirds, Great Frigatebirds, Hawaiian and Juan Fernandez Petrels, Red-necked Phalaropes and a Sooty Tern were seabird species recorded. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

*Week of 8 August 2016*

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, US Virgin Islands, spring/summer* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean and quantify breeding sex ratios. The 2016 field season concluded last week with a final 3 nests sampled, and morning surveys for green and hawksbill turtles, and excavation of hatched leatherback nests. These excavations provide a good opportunity to count hatched eggshells and study eggs/embryos that did not hatch. Graduate student Shreya Banerjee is studying hatchling size related to paternal identity, and genetic similarities of embryo twins. Research assistant Romina Ramos is studying hatchling



Romina goes to great depths to recover a temperature logger from a nest that did not hatch.

Kelly Stewart, Erin LaCasella, and Shreya Banerjee check data during the final days of the 2016 season.



morphometrics as a function of nest incubation temperature. Both of these projects will be presented at the International Sea Turtle Symposium next April. Contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) for more information.

Final totals for the 2016 season:

Nests detected: 209	Female turtles sampled: 49
Nests sampled: 93	Hatchlings sampled: 2134

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August* – Weekly Report #5 from SWFSC, MMTD biologist Jim Gilpatrick aboard the Japanese R/V *Yushin-maru no.3* (YS3): Our research survey is the **Pacific Ocean Whale and Ecosystems** cruise (**POWER 2016**) and it is a cooperative oceanic cetacean survey effort between the IWC, NOAA Fisheries and Fisheries Agencies in Japan. A total of 468 nmi of transit line were surveyed for marine mammals, seabirds and marine debris last week. Current position is approximately 420 nmi NW of the Hawaiian Islands with the ship progressing to the NW in survey mode during daylight hours at 11.5 kts. Tropical storm weather systems influenced research operations last week. Scattered rain squalls, winds up to 26 kts, rough seas and swells up to 4.5 meters were encountered. Two marine mammal sightings were recorded: a solitary bull Sperm Whale (*Physeter macrocephalus*) and a school of 12 striped dolphins (*Stenella coeruleoalba*) with 2 mother/calf pairs observed, and photographs collected. Seabirds included Brown Boobies, White-tailed Tropicbirds, Flesh-footed Shearwaters, Great Frigatebirds, Hawaiian and Juan Fernandez Petrels and a Sooty Tern. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

*Week of 1 August 2016*

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, U.S. Virgin Islands, spring/summer* – This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean and quantify breeding sex ratios. Winding down the season with one more week to go, we are nearing our goal of sampling hatchlings from every female leatherback that nested at Sandy Point. We have just 3 females left to sample and a couple of nests with unknown mothers that are due to hatch. During early June, there were only a handful of nests laid in the refuge and we are seeing that result this past week with few nests hatching 60 days incubation time). Next week should see a final increase in the number of nests hatching as the turtles made a resurgence in early June. Erin LaCasella joins the team for the final week of the project. Contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) for more information.

Nests to date: 208      Individual females: 49  
Nests sampled: 90      Hatchling samples: 1910



**Robin LeRoux surveys a fresh green turtle track during an early morning survey in the refuge.**

*Green Sea Turtle Ecological Research, Southern California*



**Joel Schumacher and Arthur Barraza release a juvenile green turtle at the Seal Beach Wildlife Refuge.**

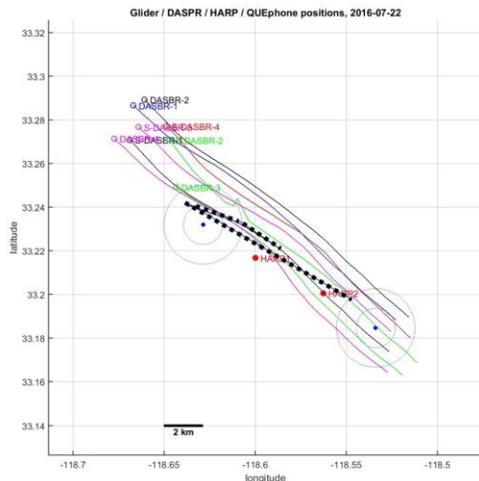
– The SWFSC Marine Turtle Ecology and Assessment Program conducted green turtle field research at the Seal Beach Wildlife Refuge (SBWR) during the past week. This is a collaborative effort with the West Coast Regional Office - Long Beach (Dan Lawson and Tina Fahy). Three juvenile turtles (mean length = 70.7 cm, SE = 0.81, mean mass = 42.3 kg, SE = 1.2) were caught, one which was a recapture from 2013. New turtles were tagged with metal flipper tags and passive-integrated transponder (PIT) tags. Biological samples were collected for genetic, contaminant, hormone, and isotope studies. A graduate student at CSU Long Beach is obtaining a master's degree through a study of determining concentrations of metal and toxins in blood and scutes. Contact PI [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.

*Improving Cetacean Passive Acoustic Monitoring Methods, Catalina Basin, Southern California Bight, 18 - 30 July* – Jay Barlow is continuing his collaborative work with Cornell University, University of St. Andrews, Oregon State, and Scripps in comparing acoustic detections of cetaceans in the Catalina Basin. DASBR (Drifting Acoustic Spare Buoy Recorders) are re-deployed each day (see Figure) to keep these instruments within the acoustic range of a SeaGlider, two HARPS (high-frequency acoustic recording packages), and one QuePhone. Instruments fill a small boat. The mission has been successful so far, and in the first five days of deployments, we found a dozen acoustic encounters with beaked



Danielle Harris (U. St. Andrews), David Mellinger (OSU), and Jay Barlow (SWFSC) aboard the USC research vessel R/V Vibrio prior to an early morning departure to retrieve and re-deploy DASBR gear. With all gear aboard, the entire vessel is filled.

whales (*Ziphius cavirostris*). Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.



**July 22, 2016 DASBRS drift tracks (fine colored lines) and SeaGlider tracks (black dashed line) relative to HARP sea-floor recorders (red dots). Blue dots with concentric rings indicate nominal turn-around points for the glider.**

**Similar 8-9 mile DASBR drifts were achieved each day, with currents tending consistently to the northwest.**

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August* – Weekly Report #4 from SWFSC, MMTD biologist Jim Gilpatrick aboard the Japanese R/V *Yushin-maru no.3* (YS3). Our research survey is the **Pacific Ocean Whale and Ecosystems** cruise (**POWER 2016**) and it is a cooperative effort between the IWC, NOAA Fisheries and Fisheries Agencies in Japan. A total of 458 nmi of transit line were surveyed for marine mammals, seabirds and marine debris during the past week. At this writing, the ship is approx. 420 nmi east of the Hawaiian Islands. Low pressure weather systems influenced operations last week with scattered rain squalls, trade winds up to 25 kts, rough seas and swells up to 4.5 meters. Only one marine mammal sighting was made, an unidentified *Mesoplodon spp.* Laysan Albatross, Brown Boobies, Tropicbirds, Shearwaters, Hawaiian and Juan Fernandez Petrels and a Great Frigatebird were sighted and photographed. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

*Week of 25 July 2016*

*California and Steller sea lion aerial survey, US West Coast, July* – The California sea lion and Steller sea lion survey was completed on July 18. A total of 34.2 hours of flight time were logged while surveying and photographing sea lions at the Channel Islands in southern California and along the coast and islands from Point Conception, California to Coos Bay, Oregon.

Approximately 91 GigaBytes of data containing over 7,000 photographs were collected during the two-week survey. The survey used a Partenavia P-68 Observer aircraft, chartered from Aspen Helicopters. The glass nose of this aircraft gives the pilot excellent forward and downward vision which makes it possible to fly precisely over sea lion haulout sites and rookeries (needed for the narrow coverage of the camera). Contact

[Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.



**NOAA Fisheries Biologist, Mark Lowry (left) and Aspen Helicopters pilot, Brad Busch (right) standing next to the Partenavia P-68 Observer used during the July California and Steller sea lion aerial survey.**

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, U.S. Virgin Islands, spring/summer* – This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation



**Gabby Carvajal excavates the nest to find hatched shells and yolkless eggs, which we will use to identify the mother turtle. UCSD graduate student Shreya Banerjee sorts the eggs while Duke graduate student Sarah DeLand records the data.**

of the genetic boundaries of leatherback populations within the Caribbean and quantify breeding sex ratios. Twenty nests were observed hatching last week, nine of which were sampled. Our goal is to sample six more this

season. Nest excavations continue, including one laid by an un-sampled female along the north shore of St. Croix and detected after hatching by one of our research assistants (Gabby Carvajal). More than 60 hatchlings made it to the water from this nest and yolkless eggs were collected to determine the maternal identity. These data

allow further refinement of estimates of clutch frequency for turtles that may not be as faithful to nesting at Sandy Point. Morning beach patrols also continue and allow tracking of all 3 turtle species (leatherbacks, greens and hawksbills) in the refuge.



**Tracks of hatchlings leading from a mystery nest on the north shore of St. Croix.**

Nests to date: 208      Individual females: 49  
Nests sampled: 84      Hatchling samples: 1793

For more information, please contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).

*Improving Cetacean Passive Acoustic Monitoring Methods, Catalina Basin, Southern California Bight, 18 – 30 July* – Jay Barlow is continuing an ONR-funded collaborative acoustic research project in collaboration with Oregon State University, Cornell, Scripps and the University of St. Andrews. The team has deployed 12 acoustic recording systems, including eight Drifting Acoustic Spar Buoy Recorders (Jay's DASBRs), a Glider sampling from 0-1000m depth, a QuePhone profiling buoy at 500m depth, and two seafloor High-frequency Acoustic Recording Packages (HARPs). The objective of this research is to compare the distances at which beaked whales and other species are detected on this wide assortment of instruments. Jennifer Keating and Eiren Jacobson have assisted with deployments aboard the chartered dive boat *Horizon*; Shannon Rankin and Annette Henry have provided shore-based logistic support. Currently the team is staying at the USC Wrigley Field Station on Catalina Island and is re-positioning the drifting buoys every day to keep the instruments together in a functioning array. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August – Weekly Report #3* from SWFSC, MMTD biologist Jim Gilpatrick aboard the Japanese *R/V Yushin-maru no.3* (YS3) in the Central North Pacific (17-23 July-2016). A total of 612 nmi were surveyed for marine mammals, seabirds and marine debris last week on this collaborative effort between the IWC, NOAA Fisheries and Fisheries Agencies in Japan. The current course is S-SW, progressing in survey mode during day-light hours at 11.5 kts. By end of week the ship should be within 450 nmi of the Big Island of Hawaii. Air temperature ranged btwn. 20.7°C - 24.9°C and Ocean SST ranged btwn. 21.2°C - 23.8°C. One Bryde's whale was sighted, photographed and a biopsy sample was collected. Also sighted was a school of 16 pygmy killer whales (*Feresa attenuata*), including two mother/calf pairs. Laysan Albatrosses, Brown Boobies, a Hawaiian Petrel, Shearwaters and Tropicbirds were observed and photographed. Survey effort was interrupted at times due to Trade-winds (15-22 kts) and scattered rain squalls. On 21-July, a glass buoy originating from the Dept. of Oceanography at Oregon State University was retrieved (at 29°-19.7'N/138°-36.6'W) and Dr. Bruce Mate at OSU has been contacted and given the information. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

### *Week of 18 July 2016*

*Improving Cetacean Passive Acoustic Monitoring Methods, Catalina Basin, Southern California Bight, 18 – 30 July* – Next week the MMTD acoustics program will be conducting a 2-week collaborative field project in the Catalina Basin with researchers from the University of Oregon, Cornell University, Scripps Institution of Oceanography, and the University of St. Andrews. This ONR-funded project will compare four different approaches to passive acoustic monitoring of cetaceans. Jay Barlow will be deploying eight of his Drifting Acoustic Spar Buoy Recorders (DASBRs). Other acoustic recording platforms will include an undersea glider, two seafloor recorders (HARPs), and a vertical profiling buoy. Instruments will be deployed on Tuesday from a charter vessel (the dive boat *Horizon*). Buoys will be re-positioned daily to maintain an array configuration to localize cetacean sources. These locations will allow detection range to be estimated for the other instruments. After the initial deployment, the field team will be staying at the USC Wrigley Station on Catalina Island and will be making excursions in a small USC charter vessel. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, U.S. Virgin Islands, spring/summer* – This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean and quantify breeding sex ratios. Hatch rates have been relatively high (45 to 70 hatchlings per nest) this year. Hatchlings from an additional 21 nests were sampled last week bringing the season total to 130 nests sampled. This includes nests from 36 of the 49 females nesting and 21 nests with unknown mothers. Hawksbill turtles (a Critically Endangered species) also nest on this beach and we have seen some hatchlings begin to emerge. This week Robin LeRoux joins the team and we will also train Paul Hillbrand (Master's student at University of the Virgin Islands), who will study hawksbill paternity at Buck Island Reef National Monument (NPS) later this summer in collaboration with us. Contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) for more information.



The contrast in size between leatherback and hawksbill hatchlings.

Nests to date: 207      Individual females: 49  
Nests sampled: 75      Hatchling samples: 1637

*Hexacopter Calibration of Cetacean School Size Estimates, Main Hawaiian Islands, 26 June - 30 July* – The UAS team of LTJG Hollis Europe and Ensign Jacob Barbaro completed another 8 flights last week with the APH-22 hexacopter from the NOAA Ship *Oscar Elton Sette*. Species photographed were killer whales (photo), pilot whales, melon-headed whales, and pygmy killer whales. Flight totals for this collaborative cruise led by Dr Erin Oleson from the Pacific Islands Fisheries Science Center are now at 41 missions and about an hour of flight time. These operations aboard the *Sette* represent the first use of the versatile hexacopter from a NOAA research ship and, thanks to the support of a great team of Officers and crew aboard the ship, operations are going very smoothly. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August* – Weekly Report #2 from SWFSC, MMTD biologist Jim Gilpatrick aboard the R/V *Yushin-maru no.3* in the Central North Pacific (10-16 July 2016). This past week survey transit progressed from 34° 44' N

Lat./174° 41' W Long. to 27° 54' N Lat./146° 13' W Long, with 398.5 nmi surveyed for marine mammals, seabirds and marine debris. Air temperature ranged between. 21.6° - 25.4° C and water temperature ranged between. 21.9° - 24.5° C. Eight Bryde's whale, 2 Sperm whale and 1 Risso's dolphin sightings were recorded; biopsy samples were collected from 3 Bryde's whales; photo-id shots were taken from 6 Bryde's whales. Numerous Albatrosses, Shearwaters and Tropicbirds were observed and photographed. Survey effort has been interrupted as a tropical depression is near-by and Hurricane Carly appears to be on its way. Winds are up to 25 kts and rough seas with swells to 4.5 m at present. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

*Green Sea Turtle Ecological Research, Southern California* – The Marine Turtle Ecology and Assessment Program conducted green turtle field research at the Seal Beach Wildlife Refuge (SBWR) and San Diego Bay (SDB) during the past three weeks. At SBWR, one adult female was caught (length = 95 cm, mass = 128 kg), the largest turtle ever caught in the refuge. At SDB, five juvenile and two adult female green turtles were caught, with lengths ranging from 62.3 cm to 101.3 cm (mass from 33 kg to 141 kg); the largest of which was first captured in 1998 and has been captured seven times since then. Of the 10 turtles captured in San Diego Bay so far this season, five were 'first captures'; this marks the highest proportion of first-time captures in more than a decade. A second recapture was first caught in 2004; this most recent capture was only the second capture of this turtle. Our capture records—and recapture rates—are used to estimate abundance and survival rates as well as somatic growth rates. Biological samples were collected for genetic, toxicology, hormone, and isotope studies. New turtles were tagged with metal flipper tags and passive-integrated transponder (PIT) tags. Three of the four turtles caught in SDB were outfitted with GPS-enabled satellite transmitters to determine their home ranges and movement patterns. The telemetry study is a collaborative effort with the Navy and the Unified Port of San Diego. For more information, please contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov).

*California and Steller sea lion aerial survey, US West Coast, July* - This survey being conducted by Mark Lowry continued up the California coast to southern Oregon last week. No California sea lions were found in southern Oregon or northern California though Steller sea lions were abundant and all of their major west coast rookeries were photographed. California sea lions were abundant in central California, with many pups being born at Año Nuevo Island. Normally around 100 pups are born at that rookery, but examination of the photographs taken on Sunday, July 17 shows that several hundred were born there this year. The increase in California sea lion pup production at Año Nuevo Island is likely due to the recent El Niño warm water conditions at the Channel Islands in southern California. The aerial survey continues this week, with the Farallon Islands, a stretch of coastline between Bodega and Año Nuevo Island, and Vandenberg Air Force Base near Point Conception planned. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.



*Aerial photograph of Steller sea lions at Saint George Reef taken from an altitude of 800 feet on July 14, 2016.*

*Week of 11 July 2016*

*Aerial Photographic Survey of California Sea Lions and Steller Sea Lions, Channel Islands & coastal California/Oregon, 5-20 July* – The California sea lion aerial survey being conducted by Mark Lowry and Beth Jaime is going well. All eight Channel Islands have been surveyed, with all pinnipeds sighted photographed from the aircraft. This week the survey continues up the California coast from Point Conception to the Oregon border, then into Oregon. For more information contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov).



**Aerial photograph of California sea lions at San Miguel Island taken from an altitude of 800 feet on July 6, 2016.**

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, U.S. Virgin Islands, spring/summer* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean and quantify breeding sex ratios. No new nests are expected this season so the focus is sampling of hatchling. Last week 21 new nests emerged and most were sampled. July 4<sup>th</sup> was especially productive, with 4 nests emerging; each yielded nearly 50 hatchlings! A total of 180 turtles we sampled that night and the team watched fireworks from the refuge beach. Daybreak morning surveys for sea turtle tracks are now being conducted. Nests that have hatched are also excavated for nest inventories: categorizing the development status of each egg (hatched, unhatched, undeveloped, dead or live) to evaluate female productivity. By identifying males through genetic sampling of their hatchlings, we can also evaluate male productivity - something that has never before been assessed for any sea turtle species.



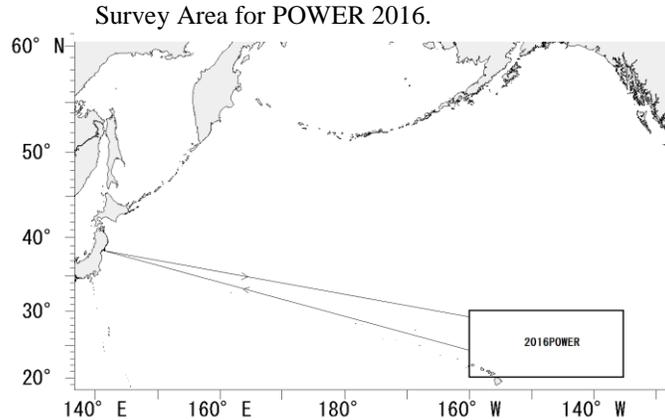
**Junior intern Drue Frey examines nest contents from a nest that hatched 3 days prior.**

Nests to date: 205      Individual females: 49  
Nests sampled: 54      Hatchling samples: 1021

For more information, please contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August -*

The *R/V Yushin-maru no 3* continues its transit from the coast of Japan to the survey area, which includes international waters and areas within the US EEZ near the Hawaiian Islands. The starting point will be at 25° N Latitude/135° W Longitude and the ship is expected to arrive there on 18 July. Sightings for the past week included a blue whale (photo), numerous Bryde's whales, Common, Striped, and Risso's dolphins, and a Sei whale. Photographs



and/or skin and blubber biopsy samples were collected from all species of whales. Oceanic birds and marine debris are being photographed as well. This research effort is a collaboration between the International Whaling Commission, NOAA Fisheries (with Jim Gilpatrick aboard), and Fisheries Agencies in Japan.

Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

### *Week of 5 July 2016*

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, U.S. Virgin Islands, spring/summer* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean, and quantify breeding sex ratios.

Nesting patrols came to an end on 30 June, with the five previous nights of no turtles. On 30 June a spectacular light show from offshore storms accompanied 2 nesting turtles: Molly (her third nest) and Leia (her eighth nest). Fiona, originally tagged in 1995, wins the title for being the largest nesting female of the season (172 cm in curved carapace length). Hatchlings have been keeping the team busy as well, with several hatchouts each night. National Geographic photographer Brian Skerry visited last week to capture photos of 3 nesting females (Panini, Perdita and Molly) under the full moon. And we were treated to a surprise visit by Sylvia Earle, who shared a few inspiring words with us, "Continue to do what you are doing and educate."



**Nesting team research assistant Romina Ramos sits with a dawn nesting turtle.**

Joining the hatchling sampling team is Nicky Beaulieu and Amy Frey.

Nests to date: 205	Individual females: 49
Nests sampled: 43	Hatchling samples: 819

For more information, please contact Kelly Stewart (<mailto:Kelly.Stewart@noaa.gov>) or Peter Dutton (<mailto:Peter.Dutton@noaa.gov>).

*Aerial Photographic Survey of California Sea Lions and Steller Sea Lions, Channel Islands & coastal California/Oregon, 5-20 July* - Mark Lowry and Beth Jaime will conduct this survey. Funding for aircraft was provided by Navy (Naval Base Ventura County - Channel Islands survey) and SWFSC (mainland coast survey). Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

*California Sea Lion Census and Diet Research, Channel Islands, Southern California Bight, quarterly* - On July 8-11, Jim Carretta and Alex Curtis will travel to San Clemente Island to collect California sea lion scat samples for diet analysis and to count pinnipeds. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

*Photogrammetry with an unmanned aerial system to assess body condition and growth of Blainville's beaked whales, Abaco Island, northern Bahamas, 8-30 June* - This past week saw the completion of this field project. Funded by the U.S. Office of Naval Research, this month-long collaboration between MMTD (John Durban, Holly Fearnbach) and the Bahamas Marine Mammal Research Organization (Diane Claridge, Charlotte Dunn) was very successful in collecting photogrammetry data from beaked whales, and other species. This was the first photogrammetry study of any beaked whale species, which are notoriously difficult to study due to their long foraging dives (>1 hr) and cryptic surfacing behavior. A total of 52 flights were successfully completed, collecting aerial photogrammetry images of Blainville's beaked whales (11 individuals, 30 flights), Sperm whales (8 individuals, 5 flights), dwarf sperm whales (2 individuals, 2 flights) and bottlenose dolphins (35 individuals, 15 flights). Data analysis will now begin to assess measurement variability across repeated photographs of the same individuals, and to assess key differences in condition and length between individuals of known age and life history status. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



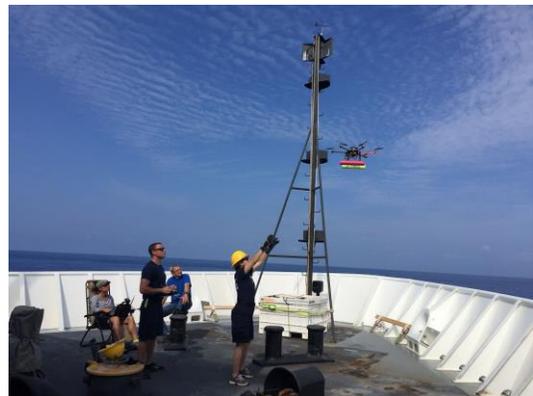
**Aerial photogrammetry images of an adult male Blainville's beaked whale (left), and a bottlenose dolphin mother and juvenile (right). Photographs taken from an unmanned hexacopter, with flight clearance from the Bahamas Department of Civil Aviation and a permit for research on marine mammals granted by the Bahamas Department of Marine Resources.**



**Section of a school of melon headed whales photographed off the Island of Hawaii.**

evaluate the ability of a small unmanned aerial platform to calibrate dolphin school size estimates. The flight team consisting of LTJG Hollis Europe and Ens. Jacob Barbaro completed a total of 33 flights which included launches and retrievals from the ship and a 19' rigid hull inflatable. The aircraft performed perfectly and the two pilots did an outstanding job. We are still working out the kinks on how to best take advantage of big ships and small boat platforms when sampling small

*Hexacopter Calibration of Cetacean School Size Estimates, Main Hawaiian Islands, 26 June - 30 July* A team from the Marine Mammal and Turtle Division working in collaboration with scientists from the Pacific Islands Fisheries Science Center completed the first week of a one-month cruise aboard the NOAA Ship *Oscar Sette* dedicated, in part, to



**Ens. Barbaro brings the APH-22 in for a catch by LTJG Europe while Jessica Bowlander (PIFSC) and Don LeRoi (Aerial Imaging Solutions) look on.**

cetaceans at sea but results so far look very promising. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Pacific Ocean Whale and Environmental Research Survey, Western & Central Pacific, July-August* - Jim Gilpatrick departed for this IWC survey aboard the R/V *Yushin-maru no.3* from the Port of Shiogama, Miyagi Prefecture, Japan on 2 July. The survey area extends from offshore of Japan to EEZ waters of Hawaii and east towards Baja California, Mexico. Gilpatrick is the U.S. NOAA Fisheries Scientist and will be involved with marine mammal observations and photography, large whale biopsy and data management and seabird photography. Marine debris will also be systematically recorded. The survey is expected to take two months. Contact [Lisa.Ballance@noaa.gov](mailto:Lisa.Ballance@noaa.gov) for more information.

### *Week of 27 June 2016*

*Hexacopter Calibration of Cetacean School Size Estimates, Main Hawaiian Islands, 26 June - 30 July* - LTJG Hollis Europe, Ens. Jacob Barbaro and Wayne Perryman will sail aboard the NOAA Ship *Oscar Sette* for Cruise number SE-16-04, in collaboration with Erin Oleson of the PIFSC. This will be the first operation of the APH-22 hexacopter from a NOAA research vessel. A primary goal of this 30-day survey is to evaluate the effectiveness of a small Unmanned Aerial System as a tool for calibrating observer estimates of the number of animals in large aggregations during cetacean assessment surveys. We will also evaluate the systems' effectiveness for identifying naturally marked cetaceans and collecting morphometric data for life history studies. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, U.S. Virgin Islands, summer* - This index nesting beach has been comprehensively monitored using a variety of



**The team treks the beach looking for hatchlings emerging from nests.**

the season to collect data for her degree on the influence of paternity on hatchling size.

Nests to date: 203      Individual females: 49  
Nests sampled: 30      Hatchling samples: 604

For more information, please contact Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)) or Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)).

Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year to update population structure, refine delineation of genetic boundaries of leatherback populations within the Caribbean, and quantify breeding sex ratios. Last week Laura Ferguson (Knauss Fellow from NMFS Office of Science & Technology) visited the field site to learn about and participate in all aspects of the project. Also joining the team is Shreya Banjerjee, SWFSC volunteer and UCSD masters student; she will remain for the duration of



**Shreya Banjerjee (left) and Laura Ferguson with straggler hatchlings rescued from an emerged nest.**

*Photogrammetry with an unmanned aerial system to assess body condition and growth of Blainville's beaked whales, Abaco Island, northern Bahamas, 8 – 30 June* - Relatively high winds limited photogrammetry efforts last week. Working with colleagues from the Bahamas Marine Mammal Research Organization, John Durban and Holly Fearnbach flew 6 hexacopter flights, collecting

photogrammetry images of a group of five Blainville's beaked whales and two bottlenose dolphins. Flight operations conclude on Wednesday this week, and a favorable weather forecast should see a busy finish. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



Aerial photogrammetry images of a group of Blainville's beaked whales (left) and a bottlenose dolphin (right). Photographs taken from an unmanned hexacopter, with flight clearance from the Bahamas Department of Civil Aviation and a permit for research on marine mammals granted by the Bahamas Department of Marine Resources.

### *Week of 20 June 2016*

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge – St. Croix, US Virgin Islands, spring-summer 2016* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean, and quantify breeding sex ratios. There has been a slight increase in number of nests laid this past week, with many females laying their 7<sup>th</sup> and 8<sup>th</sup> nests of the season, plus a couple of first nesters. Hatchlings are now regular with at least two nest emergences each night.

Nests to date: 195      Individual females: 49  
Nests sampled: 23      Hatchling samples: 414

For more information, please contact Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)) or Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)).



A newly emerged hatchling makes its way down the beach.

*Photogrammetry with an unmanned aerial system to assess body condition and growth of Blainville's beaked whales, Abaco Island, northern Bahamas, 8 – 30 June.*  
- John Durban and Holly Fearnbach flew 15 hexacopter flights last week, collecting photogrammetry images of Blainville's beaked whales, sperm whales and bottlenose dolphins. Of note, a total of 19 flights

have now been flown over Blainville's beaked whales, the primary target species, collecting >2000 images, with multiple repeat images of eight different whales. These will be used to examine measurement variability in length and width profiles of the same whales and to compare condition and size between whales. Our colleagues at the Bahamas Marine Mammal Research Organization (Diane Claridge, Charlotte Dunn) have a 25-yr photo-identification catalog for this species, enabling measurements to be linked to whales of known identity, gender, age class and life history. So far we have imaged two adult males, one sub-adult, two adult females and their dependent calves, and one single adult female that we believe to be pregnant. This is the first ever photogrammetry research on beaked whales, and these data will be essential for validating the approach and developing protocols and comparative datasets for future assessments of growth and condition of whales using Navy test ranges. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Aerial photogrammetry images of a sperm whale female and newborn calf (left) and a Blainville's beaked whale female with her 1-2 yr old calf (right). Photographs taken from an unmanned hexacopter, with flight clearance from the Bahamas Department of Civil Aviation and a permit for research on marine mammals granted by the Bahamas Department of Marine Resource**

*Week of 13 June 2016*

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the field effort this year to comprehensively sample every nesting turtle at Sandy Point for the purpose of updating population structure, refining delineation of the genetic boundaries of leatherback populations within the Caribbean, and quantifying breeding sex ratios. On 9 June, the team found the first naturally-emerging large nest of this season and sampled all emerging hatchlings (38).



**An emerging nest. Research assistant Sarah Biesemier and Duke graduate student Sarah DeLand protect the hatchlings from winged predators (frigatebirds).**

Our ultimate goal is to sample one nest from every nesting female to get an accurate assessment of all breeding males that contributed to the population this year. Even as nests begin to emerge, females continue to lay new nests. Ten new nests were found this week, including one laid by Flounder (SPP254), who has now laid 7 nests within the refuge boundaries. Our satellite and camera-tagged turtle (SPP001) returned to the beach on 4 June. The tags were removed and graduate student Ayaka Asada (Texas A&M) will sort through hundreds of hours of camera footage and dive profiles to quantify the turtle's movements during her 10 days at sea. Nests to date: 187 from 47 females; Nests emerged: 13; Hatchling samples: 210. For more information, please contact Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)) or Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)).

*Photogrammetry with an unmanned aerial system to assess body condition and growth of Blainville's beaked whales, Abaco Island, northern Bahamas, 8 – 30 June* - This collaboration between MMTD (John Durban, Holly Fearnbach) and the Bahamas Marine Mammal Research Organisation (Diane Claridge, Charlotte Dunn) aims to demonstrate the utility of photogrammetry using an unmanned hexacopter for monitoring the body condition and growth of beaked whales, to facilitate an understanding of the effect of disturbance on individual health. This has direct relevance for ongoing monitoring to understand population-level effects of disturbance in navy operation areas, specifically for Blainville's beaked whales in the Bahamas, but also other species on other Navy test ranges. This project is funded by the U.S. Office of Naval Research. This week flight operations commenced and in the first two days the team has already imaged two groups of Blainville's beaked whales – the ever first aerial photogrammetry images of this cryptic species. During 15 hexacopter flights, other species imaged/measured included bottlenose dolphins, sperm whales and dwarf sperm whales. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Aerial photogrammetry images of Blainville's beaked whales: adult male on left (see erupted teeth) and adult female with calf on right. Photographs taken from an unmanned hexacopter from >100ft altitude, with flight clearance from the Bahamas Department of Civil Aviation and a permit for research on marine mammals granted by the Bahamas Department of Marine Resources.**

*Week of 6 June 2016*

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands, April - August 2016* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the



**The team excavates a nest laid by an unknown turtle to inventory the contents and sample live hatchlings as well as collect yolkless eggshells.**

effort to comprehensively sample every nesting turtle to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean, and quantify breeding sex ratios. Twelve females laid nests last week and seven nests were observed with hatchlings emerging. Sampling of these emerging nests include recording number of hatched, unhatched, dead and live turtles, and collecting tiny skin clips from the flippers.. Because maternal DNA is contained in eggshells, we also collect yolkless eggs (or spacers) from nests laid earlier in the season. Additionally, two new nesting females (neophytes) were sampled last week. These neophyte samples are of particular interest; they will be compared to hatchlings sampled since 2009 to determine age of reproductive maturity (through

genetic matching). And, we are expecting the return of a turtle that was equipped with a video data

recorder and satellite transmitter on 3 June (deployed by graduate student Ayaka Asada of Texas A&M). During the last 10 days, the turtle has spent time over the deepwater canyon (4000 m) just north of Sandy Point. For the last two days, she has been staging along the north shore of St. Croix and has ventured close to the beaches there, but now is poised a few km directly off Sandy Point. Nests to date: 177; Individual females: 47; Nests emerged: 8; Neophytes: 27%, Remigrants (tagged in previous seasons): 73%. For more information, please contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).

*Green Sea Turtle Ecological Research, San Diego Bay, June 2016* - The Marine Turtle Ecology and Assessment Program conducted capture efforts in San Diego Bay on 1 June and caught a sub-adult green turtle weighing 44 kilograms and measuring just shy of 70 cm straight carapace length (SCL). This was the first time this turtle had been captured in the 20 years that SWFSC has been monitoring the site. Samples collected included blood to determine sex, skin for stable isotope analysis and genetic stock origin, and scutes to quantify contaminant loads. In addition, a satellite tag was attached to examine fine-scale movement patterns within San Diego Bay. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for details.

*Field Testing of Acoustic Recorders, Coastal San Diego, 7 & 9 June* - The cetacean acoustics group (Jay Barlow and Shannon Ranking) will deploy and test newly-developed passive acoustic equipment, conduct localization tests using sonobuoys, deploy drifting buoy recorders (DASBRs) for 48 hrs to test some new designs, and field test a new autonomous towed recording system. Vessel days are scheduled on the local dive boat *Horizon*. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for additional information.

### *Week of 31 May 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March - late May* - MMTD scientists completed the final week of the



**Heather Colley on watch during the final week of the gray whale calf survey.**

shore-based survey of northbound gray whale cows and calves last Friday. In 54 hours of survey effort, the team detected 16 northbound cow/calf pairs, with no calves sighted on the final day of effort. This brings the total count for the season to 367 northbound calves indicating the 5th consecutive season of very strong recruitment to this population. The team for the last week of the survey comprised Morgan Lynn, Lynn Evans, Heather Colley, and Annette Henry. The 23rd consecutive season for these surveys was the second that combined the sighting surveys with vertical photographs of cows and calves from the APH-22 hexacopter. The survey counts combined with measurements of size and shape from the aerial photographs will provide an enhanced understanding of the impact of changing environmental conditions and gray whale reproductive output. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.

*Leatherback Turtle Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, US Virgin Islands, April - August 2016* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle here this year to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean, and investigate breeding sex ratios. So far this year only 46 individuals have nested, compared to 85 turtles at this time last year. Nemo (SPP308) nested for the 6th time last week and hatchlings were sampled from two excavated nests. Graduate student Ayaka Asada (Texas A&M) deployed a video data recorder and satellite transmitter on a nesting turtle; both will be retrieved when the turtle returns to nest. Nests to date: 165; Individual females: 46; Nests emerged: 4. Contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) for more information.



Emlyn Crocker and Sarah Biesmeier collect a genetic sample from the rear flipper of a nesting leatherback.

*Green Sea Turtle Ecological Research, San Diego Bay, May 2016* - SWFSC researchers conducted their first green turtle capture efforts in San Diego Bay in 2016 on 10 May. The team caught two large female green turtles, weighing 139 kg and 141 kg, and measuring 110 cm and 108 cm, respectively, in carapace length. Both were recaptures, and one still had a satellite tag on her that was deployed at the end of 2015. Sample collection and general health assessments were done, and both were affixed with new satellite GPS tags to examine movement within the bay. The team's next capture efforts will be conducted on 1 June 2016. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) or [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.



Large female green sea turtle capture in San Diego Bay. Photo credit: Ralph Pace (NMFS Permit #16803).

### *Week of 23 May 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March - late May* - Morgan Lynn, Jim Carretta, Krista Catelani, and Tina Nguyen clocked 50.5 hours of sighting effort last week (the 8<sup>th</sup> of this season's survey) and recorded 22 cow-calf pairs (a drop from last week's 129), bringing this season's total to 351. Other species sighted included humpback whale, bottlenose dolphin, and Risso's dolphin. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.



**On Bike to Work Day 2016, Jim Carretta pedals along the path at Piedras Blancas Light Station to begin his watch as part of the gray whale survey. Photo credit: Morgan Lynn.**

*Health Assessment of Resident Killer Whales, Washington and Vancouver Island, Canada, May 2016* - Southern Resident killer whales were not sighted this past week (week 2 of 3 for this spring field effort), but photogrammetry images were obtained of the sympatric population of Bigg's ("Transient") killer whales. John Durban, Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) conducted 18 flights with an unmanned hexacopter, obtaining vertical images of 22 different Bigg's killer whale individuals. Bigg's killer whales prey on marine mammals, and this population of "West Coast Transients" has been increasing steadily over the past four decades, tracking abundance increases in their prey. Therefore these images will be useful for comparative measures of body condition and size relative to the endangered Southern Residents that are thought to be limited by availability of their primary prey, Chinook salmon. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



Aerial photograph of a group of Bigg's ("Transient") killer whales. Image taken using an unmanned hexacopter at an altitude of >100ft above the whales, with research approach authorized by NMFS permit # 16163 and airspace clearance by the FAA (2015-ESA-200-COA).

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, USVI, April - August 2016 -*



Right: The team (SCA research assistants) with a rare dawn turtle. Left: A dawn turtle (Jasmine – seen 3 times this season, and first tagged in 2006), slips back into the water after nesting.

Kelly Stewart is leading the field effort on this index nesting beach (which has been comprehensively monitored for the past 35 years) to comprehensively sample every nesting turtle this year; data will be used to update population structure, refine delineation of the genetic boundaries of leatherback populations within the Caribbean, and quantify breeding sex ratios. Last week 22 females nested, including 5 neophytes (not seen previously this season, some never previously seen) and 17 return nesters (this season). The latter included Ursula (SPP360) now seen nesting 5 times, Nemo (SPP308) seen 3 times and Crush (SPP400) seen four times. These three turtles were first tagged as putative neophytes in 2013 or 2014. And finally, hatching has begun! Two nests emerged last week and hatchling sampling will now begin in earnest with a goal of comprehensively sampling one full clutch from each nesting female. Our samples are tiny tissue clips from hatchling flippers or embryonic tissue left behind after hatching, which allow us to determine maternal and paternal lineage and refine estimates of total number of nesting females. Our nesting turtles continue to arrive with new scars and injuries, most likely from tiger shark attacks. Many have been bitten on the face and head. Nests to date: 149; Individual females: 43; Nests emerged: 2. For more information, please contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).



These tracks can only mean one thing - hatchlings are here!

### *Week of 16 May 2016*

#### *Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March -*



**Gray whale calf off Point Piedras Blancas on 12 May 2016.**  
Photo credit: Jim Carretta

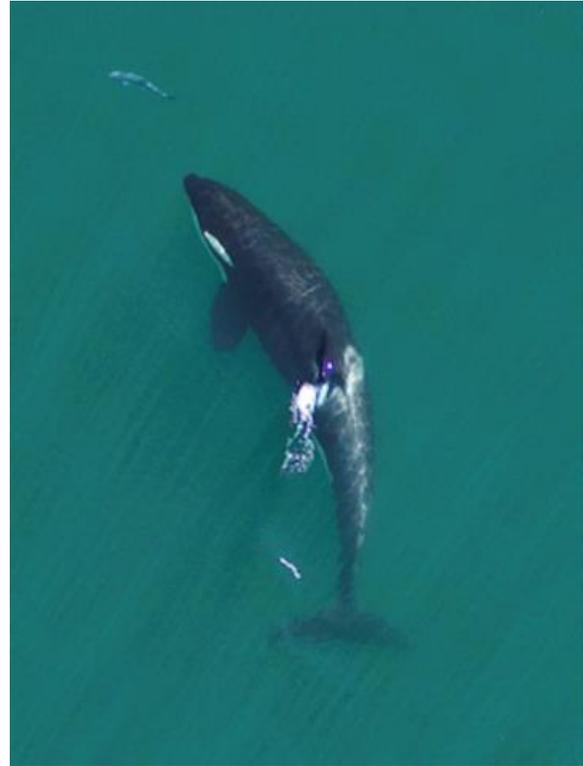
*late May* - During the seventh week of the survey (9-13 May), no time was lost to weather. In 60-hours of sighting effort, 129 cow-calf pairs were detected, the highest for the 2016 season thus far. The 2016 season total is now 329. Other species sighted last week included killer, humpback, minke, and blue whales, bottlenose, Pacific white-sided, and common dolphins. On May 13th, the team sighted NOAA ship *Reuben Lasker* to the northwest of the count site. Team members were Jim Carretta, Krista Catelani, Alex Curtis, and Paul Fiedler. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, USVI, April - August 2016* - It's been another busy week at Sandy Point! Since last Sunday night (8 May) we have had 23 new nests, at least 10 of which were laid by turtles we had already encountered this season. On our busiest night there were five turtles nesting, including Catalina (flipper tag: SPP214), who laid her 4th

nest of the season. Total number of nests on the refuge thus far is 134; we have encountered 38 individuals. This week we also assisted researchers from Texas A&M and graduate student Ayaka Asada to attach a satellite transmitter and video camera to a nesting turtle. Ayaka hopes to video-document the movements of the turtle as well as any foraging activity. For more information, contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).

*Health Assessment of Resident Killer Whales, Washington and Vancouver Island, Canada, May 2016 -*

This week a new field season began in the ongoing photogrammetry study to assess the health of the endangered Southern Resident killer whale population using coastal waters around southern Vancouver Island and Washington State. John Durban and Holly Fearnbach (MMTD) are partnering with Lance Barrett-Lennard (Vancouver Aquarium) for a third year using an unmanned hexacopter to obtain aerial photogrammetry images of killer whales for the assessment of nutritional status and reproductive success. This field effort specifically aims to add a seasonal comparison to the assessment, with sampling in both May and September, to compare the condition and growth of whales across years and between seasons. The team was helped by excellent weather conditions and has already conducted 34 flights, resulting in photogrammetry images from ~27 different Southern Resident individuals. Additionally, aerial images were collected of seven Bigg's ("Transient") killer whales for comparison of body condition and size to Southern Residents, and also of two humpback whales to contribute to an ongoing study of the health of recovering humpback populations worldwide. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Aerial photograph of J42, a 9-yr old female Southern Resident killer whale, chasing a Chinook salmon. Aerial images can be linked to whales of known age and life history using the distinctive pattern of saddle patch pigmentation that can be matched to long-term photo-identification catalogs. Photogrammetry is being used to track growth and body condition of individuals to make inference about nutritional status relative to prey (primarily Chinook salmon) availability. Image taken using an unmanned hexacopter at an altitude of >100ft above the whale, with research approach authorized by NMFS permit # 16163 and airspace clearance by the FAA (2015-ESA-200-COA).**

*Week of 9 May 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March - late May* - The sixth week of survey was completed last week in excellent weather conditions; only half an hour was lost to fog. In 59.5 hours of sighting effort, 70 cow-calf gray whale pairs and 2 adult and juvenile individuals were detected bringing this season's total to 200 cow-calf pairs. The daily rate of cow-calf pairs was lower at the end of this week suggesting the peak migration period is over. The team



**Overhead photogrammetry image of three gray whale females with their calves, migrating north past Point Piedras Blancas, CA. Photo taken from an unmanned hexacopter ~160ft above the whales, with flights over whales authorized by NMFS permit #14097 and airspace clearance by the FAA (2015-ESA-200-COA).**

continued to observe northbound blue and humpback whales. The good weather conditions enabled additional photogrammetric sampling of cow-calf pairs. Thirty-nine flights were conducted, collecting aerial photogrammetry images from 26 gray whale cow-calf pairs, and bringing the total for the 2016 three-week sampling effort to 88 flights and 67 pairs photographed. This is comparable to the 2015 sample of 66 cow-calf pairs during the first year of hexacopter operations, and will enable interannual comparisons of the condition of gray whale females and the growth of their calves. Hexacopter flight operations concluded this past week and the hexacopter flight team of John Durban and Holly Fearnbach now travel to Washington State to begin photogrammetry of Southern Resident killer whales next week. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.

*Sea Turtle Satellite Telemetry, Oman and Cape Verde, 5 - 23 May* - In collaboration with local Non-Governmental Organizations and the Omani Ministry of Environment, Manjula Tiwari will deploy satellite transmitters on nesting loggerhead sea turtles along the coast of Oman to determine their spatial and temporal interaction with local fisheries. She will then travel to Cape Verde to attend a strategy meeting for West African sea turtle projects organized by the MAVA Foundation. For more information contact [Manjula.Tiwari@noaa.gov](mailto:Manjula.Tiwari@noaa.gov) .

*Long-term Sea Turtle Monitoring, Guam/Saipan, 8-18 May* - Camryn Allen will join researchers Summer Martin and T. Todd Jones (both of Pacific Islands Fisheries Science Center), on their long-term monitoring project to determine the abundance and genetic origin of foraging green and hawksbill sea turtles in this region. Camryn will collect blood samples for hormone analysis in order to determine sex of juvenile turtles and sex ratios of the foraging aggregations. These data will ultimately be used in population modelling for abundance estimates. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) or [Camryn.Allen@noaa.gov](mailto:Camryn.Allen@noaa.gov) for further information.

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, USVI, April - August 2016* - This index nesting beach has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year for the purpose of updating population structure, refining delineation of the genetic boundaries of leatherback populations within the Caribbean, and quantifying breeding sex ratios.

May is the peak nesting month for leatherback turtles at Sandy Point, and we expect to see more females nesting with an influx of new nesters (neophytes) that have never been observed nesting. To date, we have found 12 neophytes. With 105 nests on the refuge laid by 35 individuals, we are on track to have a good season. The first nest should soon be hatching; we expect an emergence about 14 May.

Most of the turtles seen nesting have some type of scarring from previous predator attacks or anthropogenic events; recently each turtle has new scars from fresh wounds. Several turtles now show shark scars and teeth scrapes. Part of our injury study (documented by Duke Masters student Sarah DeLand) will be to look at the rate of healing of these new wounds. For more information, contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).



A track left by a nesting female at Sandy Point.

### *Week of 2 May 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March - late May* - Last week was the fifth week of the survey and high winds significantly reduced our sighting and photogrammetry efforts. In 32 hours of sighting effort, 36 cow-calf pairs were detected (bringing this season's total to 130) plus 6 adult and juvenile individuals. The team also observed northbound blue and humpback whales. The windy weather provided few opportunities for UAS operations: John Durban and Holly Fearnbach completed 9 flights with the hexacopter, on four different days, and obtained vertical images from 6 gray whale cow-calf pairs (41 pairs in total this year). The forecast for this coming week is good, and we expect to get in more survey and photogrammetry effort. SWFSC Director and Deputy Director, Cisco Werner and Kristen Koch, will be on site this week to observe the survey effort and to watch the hexacopter used for photogrammetric sampling first hand. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.

*Green Sea Turtle Ecological Research, Seal Beach National Wildlife Refuge, Southern California, 28 April* - Scientists from the Marine Turtle Ecology and Assessment Program conducted a green turtle capture effort as part of a continuing collaborative research project with the West Coast Region, Long Beach office, and California State University, Long Beach. Two green turtles (65.6 and 47.5 cm straight carapace length) were captured, both for the first time in this multi-year project. Both were given flipper and passive integrated transponder tags, and biological samples (skin and blood) were collected for

genetic, hormone, toxicity, and contaminant analyses. For more information, please contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov).

*Leatherback Turtle Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, USVI, April - August 2016* - The leatherback nesting season continues at Sandy Point National Wildlife Refuge on St. Croix, US Virgin Islands. This index nesting beach has been comprehensively monitored for the last 35 years. Kelly Stewart is leading the effort to comprehensively sample every nesting turtle at Sandy Point this year for the purpose of updating population structure, refining delineation of the genetic boundaries of leatherback populations within the Caribbean, and looking at breeding sex ratios.

Since 15 April, rate of nest laying has increased with 12 new nesting turtles identified and sampled, and 32 individuals seen overall. There are now 81 nests on the refuge. On 18 April, a female turtle leaving her nest on the beach was attacked by a shark. The Student Conservation Association (SCA) team observed the entire attack, which lasted for 20 minutes in water about 40 feet deep. The turtle appeared to escape, but has not been observed nesting since then. This year we are particularly interested in documenting injuries to nesting females to assess risk to the population from natural predators (e.g., sharks), and anthropogenic sources (e.g., fisheries interactions, boat strikes). This is the subject of Duke University graduate student Sarah DeLand's Masters project (co-supervised by Kelly Stewart). Sarah will join the team this week.

Efforts are also underway this week to target hatchlings from nests that were laid in the early season for genetic sampling with a goal of identifying the mothers of those nests through genetic fingerprinting. Our goal is to identify every female nesting here and better characterize the male population. We will also host Luis Crespo (and volunteers) from ATMAR (Amigos de las Tortugas Marinas - <http://www.tortugasmaunabo.com/>), of Maunabo, Puerto Rico for genetic sampling training and information exchange on leatherback nesting and overlap between the two islands as part of our comprehensive efforts to better characterize the population structure of leatherbacks in the Northern Caribbean. For more information, please contact [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) or [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov).

### *Week of 25 April 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March - late May* – Last week, the fourth of this shore-based survey, was one of beautiful weather and a sharp increase in the number of cow/calf pairs. In 53 hours of sighting effort we detected 65 cow-calf gray whale pairs, and 14 adult and juvenile individuals. This brings our total number of calves for the 2016 season to 94 as we head into the peak of the migration over the next two weeks. The great weather allowed 39 hexacopter flights to be conducted for photogrammetric assessment of the condition of gray whale females and the growth of their calves. John Durban and Holly Fearnbach collected vertical images of 35 female-calf pairs and four juveniles - already over half the sample size collected in the full three-week sampling last year, with still two weeks remaining of the 2016 photogrammetry effort. The team also sighted nice northbound blue whales which is unusual for this early in the season. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.



The SCA leatherback intern team, Duke Sea Turtle class, and local high school students participate in an island-wide trash cleanup along roadways in preparation for the 28<sup>th</sup> St. Croix International Ironman (70.3 miles) (<http://www.stcroixtriathlon.com/>). The cleanup was organized by the St. Croix Environmental Association, a local NGO.



**At left: Overhead photogrammetry image of a gray whale female and her calf migrating north past Point Piedras Blancas, CA. Photo taken from an unmanned hexacopter ~160ft above the whales, with flights over authorized by NMFS permit #14097 and Class G MOU # 2016-ESA-3-NOAA. Right: Holly Fearnbach and John Durban launching hexacopter at Piedras Blancas.**

*Week of 18 April 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March -*

*late May* - Although high winds cut our effort from a scheduled 60 hrs to 39 hrs, we sighted 22 cow/calf pairs, 12 single adults, and 6 juveniles last week. Our total of 29 calves by April 15th is right in line with what we have recorded the previous four seasons, which have all resulted in high calf estimates (over 1000) by the end of the respective surveys. This week MMTD's hexacopter flight team, John Durban and Holly Fearnbach, will begin a second year of photogrammetry sampling to assess interannual variability in the condition of gray whale females and the growth of their calves. Test flights were successfully conducted this past weekend, with the collection of the first gray whale vertical images of the year. Photogrammetry images will be collected over the next three weeks. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.



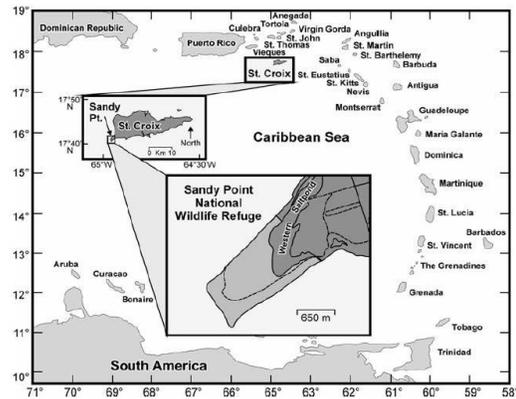
**Jim Gilpatrick and Vicki Pease on watch at Piedras Blancas for gray whales migrating north.**



Overhead photogrammetry image of a gray whale female and her calf migrating north past Point Piedras Blancas, CA. Photo taken from an unmanned hexacopter ~130ft above the whales, with flights over authorized by NMFS permit #14097 and Class G MOU # 2016-ESA-3-NOAA.

*Leatherback Genetic Identity Sampling, Sandy Point National Wildlife Refuge, St. Croix, USVI, April - August 2016* - The leatherback nesting season has begun at Sandy Point National Wildlife Refuge

(SPNWR) on St. Croix, US Virgin Islands, an index nesting beach that has been comprehensively monitored using a variety of Capture-Mark-Recapture (CMR) methods for the last 34 years that is managed by the USFWS as one of the most important leatherback nesting beaches under US jurisdiction (Dutton et al. 2005). This year, the SWFSC is collaborating closely with USFWS to maximize the scientific focus and output of this long-term project. The richness and consistency of the demographic data collected for this population offers unique opportunities for research and development of tools & approaches for determining vital rate parameters that are needed to improve stock assessments in sea turtles.



Sandy Point National Wildlife Refuge is located on the western tip of St. Croix, US Virgin Islands.



**Claudia Lombard, USFWS Refuge biologist (left) and the 2016 field team of 6 SCA Interns on the leatherback nesting beach in St. Croix, US Virgin Islands.**

In 2009 MMTD researchers began a project jointly with USFWS to sample and genotype hatchlings at SPNWR. Hatchling genetic “fingerprints” can be compared to those of new nesting females each year. Eventually, we hope to match a turtle that left the nesting beach in a known year with a first-time nester. This information would provide the first direct evidence of age of reproductive maturity in leatherbacks. We are now entering a new “recapture” phase in this long-term research effort, as we focus on sampling all the new nesting females to identify whether any are turtles that we sampled as hatchlings when they were born. It has now been 6 years since the first large cohort of hatchlings were sampled, and we will have the first opportunity to test the hypothesis put forward by some studies that leatherbacks mature within 5-6 years.

Kelly Stewart is leading MMTD’s scientific team. Additional research includes updating population structure, refining delineation of the genetic boundaries of leatherback populations within the Caribbean, and looking at breeding sex ratios. We have been able to use kinship analysis to compare the genetic identity of hatchlings with that of their mother to derive paternal genetic identities and census the cryptic male breeding population. Since sea turtles have temperature-dependent sex determination, there is growing concern that warming trends on nesting beaches will skew sex ratios. However, our results to date show that there are as many males as females breeding in the St. Croix breeding population (Stewart and Dutton 2014).

Kelly is also helping Claudia Lombard, USFWS refuge biologist, train six Student Conservation Association (SCA) Interns and two Masters students in all aspects of nesting beach biology and data collection. In the future, we hope to further expand the scope of the scientific work, and this will be achieved with closer partnerships with the USFWS and other entities under a Cooperative Agreement being developed between the two agencies.

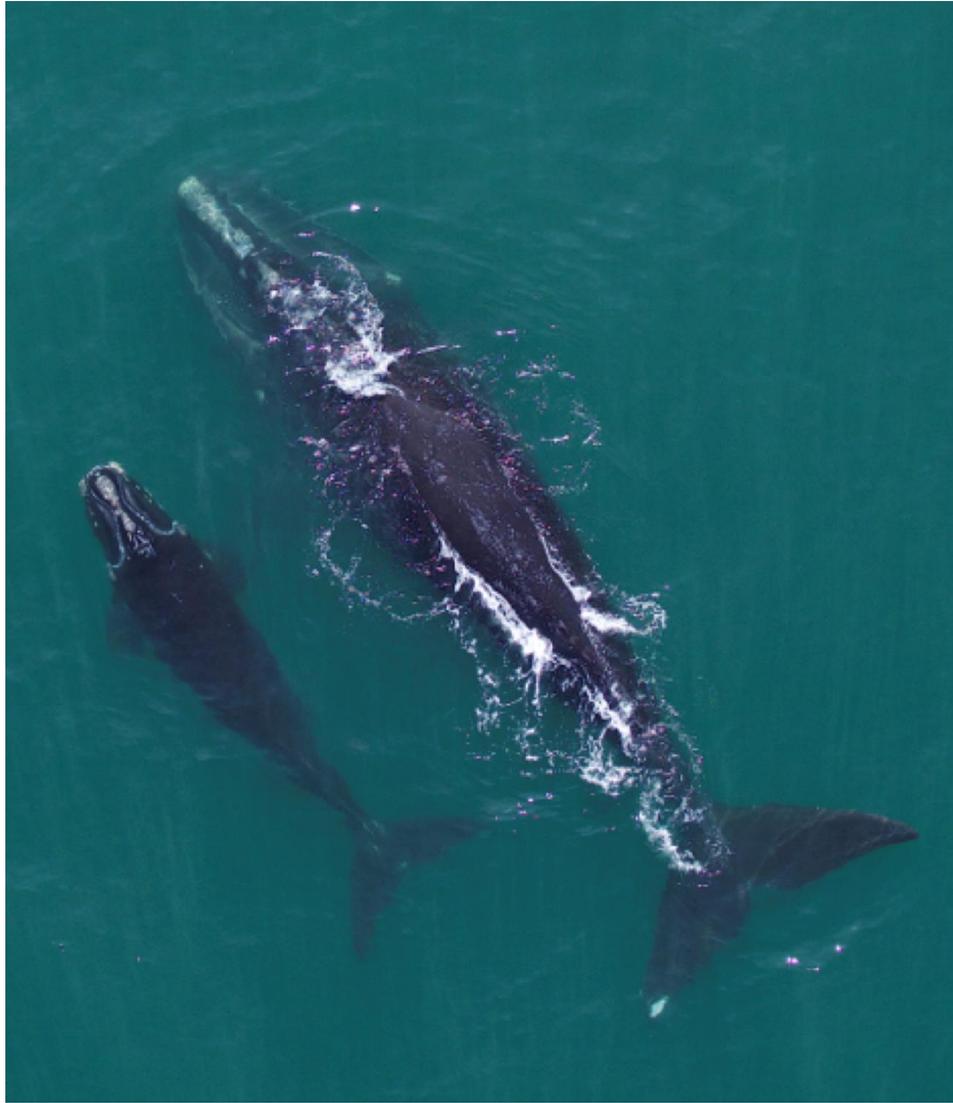
Leatherback nesting began on 28 February and nest numbers have been increasing since then. To date, there are 45 nests in the refuge; 17 genetic samples have been collected. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

### *Week of 11 April 2016*

*Development of Non-invasive Health Indices for Large Whales, Cape Cod, MA* - This week fieldwork was completed on North Atlantic right whale health assessment in Cape Cod Bay, MA; a collaboration between John Durban and Holly Fearnbach (MMTD), and Michael Moore (Woods Hole Oceanographic Institute). In total 67 flights were conducted with a small, unmanned hexacopter over the last three weeks, collecting high quality vertical images of ~35 different whales (see photo below) and 16 blow samples for studies of respiratory microbiology in collaboration with Amy Apprill and Carolyn Miller at WHOI. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Holly.Fearnbach@noaa.gov](mailto:Holly.Fearnbach@noaa.gov).



**The intern team removes obstacles from the nesting beach for the turtles.**



**Overhead photogrammetry image of a North Atlantic right whale female (measured at 45ft long) and her first calf (measured at 25ft) in Cape Cod Bay. Photo taken from an unmanned hexacopter >150ft above the whales, with research approach authorized by NMFS permit #17355 and flights under Class G MOU # 2016-ESA-3-NOAA.**

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March - late May* – A day and a half of effort was lost to weather last week; the scientific team recorded 6 cow/calf pairs plus 36 adult and 4 juvenile gray whales during the rest of the week. The transition from the adult/juvenile phase of the migration is clearly now underway; we expect to see a continued rise in northbound calves and a concurrent drop in adults migrating without calves. See <https://swfsc.noaa.gov/textblock.aspx?ParentMenuId=230&id=1431> and contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.

*California Sea Lion Census and Diet Research, Channel Islands, Southern California Bight, quarterly* - On 12-14 April 2016, Mark Lowry and Beth Jaime will travel to San Nicolas Island to collect California sea lion scat samples for diet analysis. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

*Week of 4 April 2016*

*Development of Non-invasive Health Indices for Large Whales, Cape Cod, MA* - The collaborative team of John Durban and Holly Fearnbach (MMTD) and Michael Moore (Woods Hole Oceanographic Institute) conducted 31 flights with a small, unmanned hexacopter last week to obtain high quality vertical images of ~20 North Atlantic right whales for photogrammetric measurement of body condition. Some 35 individual whales have now been photographed for the study this season. A total of 10 blow samples have been collected for studies of respiratory microbiology (see Figure) in collaboration with Amy Apprill and Carolyn Miller at WHOI. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Holly.Fearnbach@noaa.gov](mailto:Holly.Fearnbach@noaa.gov).



**Left: Head of North Atlantic right whale imaged when collecting blow sample with an unmanned hexacopter (see closed blowhole in center of image). Above: the hexacopter approaching the characteristic v-shape blow of a right whale. Research flights authorized by NMFS permit no. 17355 and class G MOU no. 2016-ESA-3-NOAA.**

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March – late May* – The 23rd consecutive year of surveys of northbound eastern (and maybe some western) north Pacific gray whale calves began last week. One day was lost to high winds, but the remaining days included 46 hours of effort by a team led by Morgan Lynn and a total of 139 adults, 16 juveniles, and 1 gray whale calf recorded. See <https://swfsc.noaa.gov/textblock.aspx?ParentMenuId=230&id=1431> and contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details.

### *Week of 28 March 2016*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 28 March – late May* - On Saturday, 26 March, a team from the MMTD traveled north to the Piedras Blancas Light Station to begin the 23rd consecutive shore-based survey of northbound eastern north Pacific gray whale calves. Based on results from previous surveys we have demonstrated that calf production for this population is linked to the timing of the melt of seasonal ice in the Arctic. We hypothesize that ice acts as a physical barrier, blocking access to prey for pregnant females and impacts the probability that existing pregnancies will be taken to term. This is the second season during which we will collect vertical aerial images of northbound cow/calf pairs from our APH-22 hexacopters, piloted by John Durban. The aircraft operations team also includes Holly Fearnbach who uses live video from the aircraft to help the pilot hover the aircraft over the northbound whales. Measurements from images collected from this small

drone will be used to assess the impacts of rapidly changing environmental parameters in the Arctic on the condition of reproductive females and their calves. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for details. More information at <https://swfsc.noaa.gov/textblock.aspx?ParentMenuId=230&id=1431>



**Left: Gray whale cow/calf pair as viewed from hexacopter of Piedras Blancas. Right: MMTD observers on watch at Piedras Blancas for cow/calf pairs. Photo credits: NOAA.**

*California Sea Lion Census and Diet Research, Channel Islands, Southern California Bight, quarterly* - Mark Lowry, Cisco Werner (SWFSC Director), and William Stelle (Regional Administrator, West Coast Region) traveled to San Clemente Island 25-28 March to collect California sea lion scat samples for diet analysis and to count pinnipeds. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for information.

*Development of Non-invasive Health Indices for Large Whales, Cape Cod, MA* - This was a great week for photogrammetry-quality photographs as part of an ongoing collaborative project on large whale health assessment. MMTD Scientists John Durban and Holly Fearnbach, partnering with Michael Moore and colleagues from Woods Hole Oceanographic Institution (WHOI), were able to use a small unmanned hexacopter to obtain amazing resolution to see natural marks and entanglement scars (see caudal peduncle area of whale in photograph at fluke insertion), and their altitude data will enable precise photogrammetric measurements of body condition. The team will also collect blow samples for studies of respiratory microbiology. In combination, these approaches are being used to develop non-invasive health indices for large whales. This field effort (representing a second partnership between MMTD and WHOI) will focus on North Atlantic right whales in Cape Cod Bay, Massachusetts, building on a successful first field study of humpback whales in July 2015 (<http://www.who.edu/news-release/whalecopter>). Wayne Perryman's team at SWFSC will analyze photogrammetry images, and funding support for this field effort is provided by the NEFSC's Large Whale Team. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Holly.Fearnbach@noaa.gov](mailto:Holly.Fearnbach@noaa.gov) for additional information.



Image of right whale with scarring at caudal peduncle (see text above) taken with hexacopter. Photo credit: NOAA.

### *Week of 21 March 2016*

*Development of Non-invasive Health Indices for Large Whales, Cape Cod, MA* - This week a new field effort will begin for an ongoing collaborative project on large whale health assessment. MMTD Scientists John Durban and Holly Fearnbach are partnering with Michael Moore and colleagues from Woods Hole Oceanographic Institution (WHOI) to use a small unmanned hexacopter to obtain high quality vertical images of whales for photogrammetric measurement of body condition, and to collect blow samples for studies of respiratory microbiology. In combination, these approaches are being used to develop non-invasive health indices for large whales. This field effort (representing a second partnership between MMTD and WHOI) will focus on North Atlantic right whales in Cape Cod Bay, Massachusetts, building on a successful first field study of humpback whales in July 2015 (<http://www.who.edu/news-release/whalecopter>). Photogrammetry images will be analyzed by Wayne Perryman's team at SWFSC, and funding support for this field effort is provided by the NEFSC's Large Whale Team. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Holly.Fearnbach@noaa.gov](mailto:Holly.Fearnbach@noaa.gov) for additional information.

### *Week of 16 February 2016*

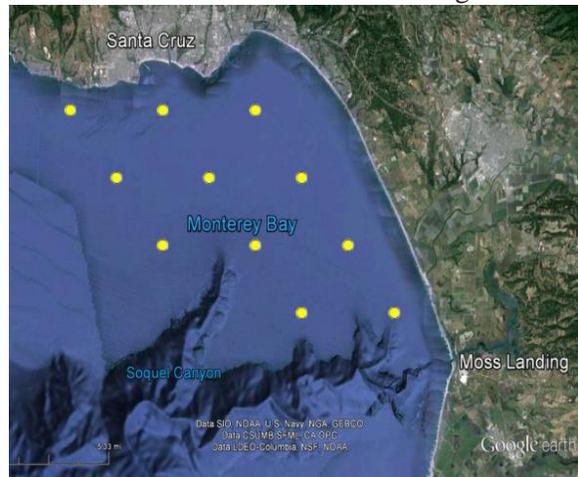
*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, 3 December-13 February* - The 2015/2016 gray whale abundance survey was successfully completed last week. Infrared cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting nearly 1,800 hours of data, and will continue to record southbound and northbound whales until 1 June. Visual observations began on 30 December and

finished on 12 February. Last week the number of group sightings per day declined to 12-15, as expected for this point in the migration, and the onset of a notable number of northbound whales was recorded. Other cetaceans sighted included: common dolphins, bottlenose dolphins and humpback whales. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).

### *Week of 8 February 2016*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, 3 December-13 February* - The 2015/2016 gray whale abundance survey successfully completed week 6 of 7. Infrared cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting nearly 1,600 hours of data. Visual observations began on 30 December and will continue until 13 February. Last week, the number of group sightings per day declined to 25-35, as expected for this point in the migration, and the onset of a notable number of northbound whales was recorded. Other cetaceans sighted included: common dolphins, Risso's dolphins, bottlenose dolphins and humpback whales. This week, the visual observer team is Hollis Europe, Jim Gilpatrick, and Morgan Lynn. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see a new NOAA Fisheries story on the project at [http://www.nmfs.noaa.gov/stories/2016/01/automatic\\_whale\\_detector\\_version2.0.html](http://www.nmfs.noaa.gov/stories/2016/01/automatic_whale_detector_version2.0.html).

*Harbor Porpoise Passive Acoustic Research, Monterey Bay, CA* - Eiren Jacobson (SIO graduate student) and Karin Forney successfully retrieved 11 moorings with C-PODs (harbor porpoise echolocation-click detectors) from Monterey Bay last week. Operations were conducted aboard the Moss Landing Marine Laboratories (MLML) R/V *Sheila B* with the capable assistance of Captain John Douglas and two teams of MLML scientific divers. Seven moorings were retrieved by triggering an acoustic release installed just above the anchor weight. Three shallow water moorings with sand anchors and one acoustic release mooring that malfunctioned were retrieved by the divers. The array of 11 C-PODs was deployed in late August 2015 and collected 5 months of continuous data on harbor porpoise occurrence within northern Monterey Bay. Eiren will analyze the new data along with data collected during the previous two years as part of her doctoral research at SIO. For additional information contact [Karin.Forney@noaa.gov](mailto:Karin.Forney@noaa.gov).



C-POD mooring locations in northern Monterey Bay.

### *Week of 1 February 2016*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, 3 December-13 February* - The 2015/2016 gray whale abundance survey successfully completed week 5 of 7. Infrared cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting nearly 1,450 hours of data. Visual observations began on 30 December and will continue until 13 February. Last week, the number of group sightings per day ranged from 72-83. Other cetaceans sighted included: common dolphins, Risso's dolphins, bottlenose dolphins, and humpback whales. This week, the visual observer team is Hollis Europe, Morgan Lynn, and Dave Weller. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see a new NOAA Fisheries story on the project at [http://www.nmfs.noaa.gov/stories/2016/01/automatic\\_whale\\_detector\\_version2.0.html](http://www.nmfs.noaa.gov/stories/2016/01/automatic_whale_detector_version2.0.html).

*Hawksbill Sea Turtle Research, Coiba National Park, Panama, 30 January-5 February* - Jeff Seminoff and Alexander Gaos will travel this week to The Coiba Archipelago National Park in the Panamanian Pacific to study foraging and nesting hawksbill turtles. Hawksbills are one of the rarest sea turtles in the eastern Pacific and previous research by Seminoff, Gaos, and colleagues has highlighted Coiba NP as one of the most important hotspots for foraging juvenile and adult hawksbills in the entire eastern Pacific. Joined by biologists from Panama's Ministry of the Environment and Conservation International the team will undertake capture efforts at the numerous coral reefs in the area and conduct night patrols for nesting activity. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for additional information.

#### *Week of 25 January 2016*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, December 2015 – June 2016* - The 2015/2016 gray whale abundance survey continues to go well despite some stormy weather encountered last week. Infrared cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting nearly 1,300 hours of data. Visual observations began on 30 December and will continue until 13 February. Last week, the number of groups sighting per day, hampered by poor weather and some loss of effort, ranged from 27-80 for a total of nearly 230 whales. This week, the visual observer team is Kerri Danil, Brittany Hancock-Hanser and Dave Weller. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see a new NOAA Fisheries story on the project at [http://www.nmfs.noaa.gov/stories/2016/01/automatic\\_whale\\_detector\\_version2.0.html](http://www.nmfs.noaa.gov/stories/2016/01/automatic_whale_detector_version2.0.html).

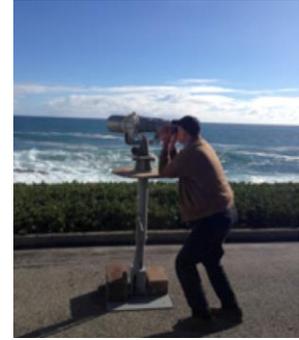
#### *Week of 18 January 2016*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, December 2015 – June 2016* - The 2015/2016 gray whale abundance survey continues to go well. Infrared cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting nearly 1,100 hours of data. Visual observations began on 30 December and will continue until 13 February. Last week, high numbers of migrating gray whales were counted, with the number of group sightings per day ranging from 69-107 for a total of nearly 850 whales. This coming week the visual observer team is Susan Chivers, Brittany Hancock-Hanser, and Alexa Kownacki. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see [http://www.fisheries.noaa.gov/stories/2015/02/gray\\_whale\\_survey\\_thermal\\_imaging.html](http://www.fisheries.noaa.gov/stories/2015/02/gray_whale_survey_thermal_imaging.html).

*Antarctic Killer Whale Research, Antarctic Peninsula, January – March* - Fieldwork has begun for the eighth consecutive year of investigations into the ecology of killer whales around the Antarctic Peninsula. This long-term study is collecting empirical data to evaluate the trophic impacts of killer whales as top predators within this rapidly-changing system. John Durban and Holly Fearnbach (MMTD) are onboard the expedition ship *National Geographic Explorer*, hosted by Lindblad Expeditions and National Geographic Society. The ship conducts expeditions in the Antarctic Peninsula area, providing an excellent opportunistic research platform. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for details.

#### *Week of 11 January 2016*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, December 2015 – June 2016* - The 2015/2016 gray whale abundance survey is going well despite stormy conditions last week. Infrared cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting nearly 900 hours of data. Visual observations began on 30 December and will continue until 13 February. In addition to high numbers of migrating gray whales last week, sightings were also made of humpback whales, Risso's dolphins and common dolphins. This week, the visual observer team is Susan Chivers, Paul Fiedler, and Alexa Kownacki. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see [http://www.fisheries.noaa.gov/stories/2015/02/gray\\_whale\\_survey\\_thermal\\_imaging.html](http://www.fisheries.noaa.gov/stories/2015/02/gray_whale_survey_thermal_imaging.html).



**"Tall Paul" Fiedler searching for an elusive whale at Granite Canyon, California.**

#### *Week of 4 January 2016*

*Green Sea Turtle Ecological Field Work, San Diego Bay, 15-Dec-2015* - The Marine Turtle Ecology & Assessment Team caught one adult turtle during a field outing into San Diego Bay on Tuesday, 15 Dec. The 138 kg female green has been caught 4 times since her first capture in 1998, when she weighed just 12 kilos! A satellite GPS tag was attached to her carapace to examine movement and habitat use in the bay (see photo). This satellite tracking is being conducted through a partnership between NMFS, Navy, and the Unified Port of San Diego. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.



**Female green sea turtle with satellite GPS attached. Photo taken by Ralph Pace under NMFS permit no. 16803.**

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, California, December 2015 – June 2016* - The 2015/2016 gray whale abundance survey is well underway. Infrared

cameras have been autonomously recording the numbers of whales migrating south past the field station since 3 December, thus far collecting more than 750 hours of data. Bob Brownell, Wayne Perryman, and Dave Weller began visual observations on 30 December. This human observer effort will continue until 13 February and represents the 28th abundance survey conducted on the population since 1967. In addition to high numbers of migrating gray whales last week, sightings were also made of humpback whales, Risso's dolphins, and common dolphins. This week, the visual observer team will be Paul Fiedler, Michael Smith, and Dave Weller. For details, please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see [http://www.fisheries.noaa.gov/stories/2015/02/gray\\_whale\\_survey\\_thermal\\_imaging.html](http://www.fisheries.noaa.gov/stories/2015/02/gray_whale_survey_thermal_imaging.html)



Dave Weller and Bob Brownell (left) and infrared cameras (right) simultaneously counting gray whales during the 2015/2016 abundance survey at Granite Canyon, California.

### *Week of 7 December 2015*

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* – Vaquita Expedition 2015 concluded on December 3 in San Felipe, Mexico. All Primary and Core transect lines were completed. Vaquita went from the most common species sighted in 2008 to



one of the most rare in 2015, confirming the strong decline in abundance indicated by acoustic monitoring data. A meeting of expert analysts has been scheduled for late March and release of the abundance estimate from this 2015 survey is expected in May. We are very grateful to SEMARNAT and SWFSC, NOAA Fisheries, the two sponsoring agencies of this survey, and to many other parties (fully acknowledged in the summary report posted on the Vaquita Expedition website). Read more about the survey and see photos and video at <https://SWFSC.noaa.gov/MMTD-vaquita2015> and/or contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) for details.

*Gray Whale Abundance Survey - Granite Canyon Field Station, California, December 2015 – May 2016* - Week two is underway. On 4 December, Morgan Lynn, Hollis Johnson and Dave Weller worked to get a thermal sensor camera system set up and running. These cameras will now autonomously record the numbers of whales migrating by the field station (southbound and northbound) through 31 May (see [http://www.fisheries.noaa.gov/stories/2015/02/gray\\_whale\\_survey\\_thermal\\_imaging.html](http://www.fisheries.noaa.gov/stories/2015/02/gray_whale_survey_thermal_imaging.html)). This effort will be augmented with a full visual observer effort, representing the 28th abundance survey since 1967, during the southbound migration between 30 December 2015 and 13 February 2016. Special

thanks to Ravi Shiwmgal for his technical expertise on this project. For details, please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov) or [wayne.perryman@noaa.gov](mailto:wayne.perryman@noaa.gov).

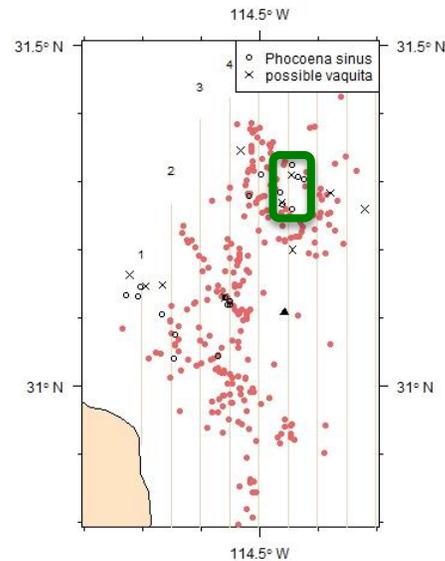
### *Week of 30 November 2015*

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* – Although exceptionally windy conditions persist, we managed a few excellent days of survey last week. On November 24 we hosted 13 representatives of the fishing communities from this region. The day was chosen to give the best opportunity possible to have the fishermen see not only our work but vaquitas themselves. We were successful on both counts. Only a few fishermen actually got to see vaquitas, but there were none in the group denying the existence of vaquitas by day's end. As was the case in 2008, the exchange of information with leadership of the fishing cooperatives was a positive experience. November 27 was another exceptional day as we closed the final large gap in the survey tracklines. We now have even coverage across the planned study area and any additional good weather will be used to concentrate on increasing precision in the proportion of vaquitas seen in front of the ship. Despite the conditions being much worse than average for this time of year, the study is essentially complete. More details will be given in the final survey weekly when the survey ends later this week. Read more about the survey and see photos and video on the Vaquita Expedition 2015 website at <https://SWFSC.noaa.gov/MMTD-vaquita2015> and/or contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) details.

*Gray Whale Abundance Survey, Granite Canyon Field Station, California, December 2015 – February 2016* - This week marks the beginning of the 2015/2016 gray whale abundance survey. Thermal sensor cameras to autonomously record the numbers of whales migrating by the Granite Canyon field station will be started on 3 December (see [http://www.fisheries.noaa.gov/stories/2015/02/gray\\_whale\\_survey\\_thermal\\_imaging.html](http://www.fisheries.noaa.gov/stories/2015/02/gray_whale_survey_thermal_imaging.html)). This census will be augmented with a full visual observer effort between 30 December 2015 and 13 February 2016 during the southbound migration, representing the 28th census since 1967. The eastern north Pacific stock of gray whales migrates annually along the west coast of North America from high latitude feeding grounds to winter breeding grounds in the lagoons and adjacent ocean areas off Baja California, Mexico. Population models based on past survey data show that gray whales have recovered from whaling in the 19th and 20th centuries, with the 2010/2011 population estimate totaling nearly 21,000 whales (Durban et al., in press). For details, please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov), [wayne.perryman@noaa.gov](mailto:wayne.perryman@noaa.gov) or [john.durban@noaa.gov](mailto:john.durban@noaa.gov).

### *Week of 23 November 2015*

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* – Exceptionally windy conditions have continued for most of Leg 2. On one of our good days we had three vaquita sightings. All were within a tiny area (within the green box in the figure) as were sightings from 2 other days. The remaining vaquitas are consistently found in only a few places. The pink dots in the figure show the location of sightings from surveys in 1993, 1997 and 2008. Confirmed vaquita sightings from 2015 (black circles) show that we are seeing fewer vaquitas in a smaller area relative to previous years. You can see a video of these vaquitas at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=676&id=21364> (thanks to Suzanne Yin and her iPhone through the ‘big eyes’ with Ernesto Vázquez as editor). Read more about the survey and see photos and video on the Vaquita Expedition 2015 website at <https://SWFSC.noaa.gov/MMTD-vaquita2015> and/or contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) details.



**A close up view of just the area with vaquita sightings from 1993-2015. 2015 confirmed vaquita (black circles) and possible vaquita sightings (black X's) are compared to sightings from all previous surveys (pink). The green box shows where three sightings were recently made.**

### *Week of 16 November 2015*

*Collaborative (SWFSC/AFSC) Large Whale Survey (CLaWS), West Coasts of U.S. & Canada, 9 July - 9 November* - NOAA ship *Reuben Lasker* returned to San Diego on 9 November after nearly four months surveying for large whales off the U.S. and Canadian west coasts between northern California and Kodiak, Alaska. Major achievements of this effort include: (1) the first range-wide assessment of gray whales that summer south of the Aleutian Islands, (2) a dedicated visual line-transect and acoustics survey for critically endangered right whales in the Gulf of Alaska, and (3) sampling (photographic and biopsy) of blue, humpback and fin whales. Nearly 3,000 cetacean sightings, 10,000 photo-identification images and 100 biopsies were collected. The successful completion of CLaWS marks the first scientific mission for NOAA Ship *Reuben Lasker*. Details of this project and related summary reports can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861> and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov).



Photograph taken under NMFS Permit No. 14097

**Gray whale feeding off British Columbia, Canada. Photo credit: NOAA Fisheries, Southwest Fisheries Science Center.**

### *Week of 9 November 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLAWS), West Coasts of U.S. & Canada, 9 July - 9 November* - NOAA ship *Reuben Lasker* and the CLAWS science team spent last week working the area from Monterey Bay to Catalina Island. While no gray whales were seen, photographs for individual identification and biopsy samples were obtained from several other species, including blue whale, fin whale, humpback whale, bottlenose dolphin, and long-beaked common dolphin. While in Monterey Bay, we contacted fellow MMTDer Karin Forney and Scott Benson for real-time data on sightings within the bay. They were conducting a carcass survey on the beach at the time (on a weekend; we confirmed this through our 25x binoculars and from our RHIB) and provided us with the location of bottlenose dolphins within their sight. Other highlights included the retrieval of a deep-sea ocean noise buoy from the vicinity of Santa Cruz Island and the re-deployment of the buoy with a new recording package. Kudos to the crew of *Reuben Lasker* and Dale Hubbard of Oregon State University for a safe and successful redeployment. On Monday, 9 November, CLAWS will come to a successful close and so too, will the maiden voyage of the *Lasker*. Many thanks to the crew and command for a safe and very successful survey and to all the scientists that participated in a wide diversity of weather conditions and venues over all 5 legs! Details of this project can be found at

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861> and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Jim.Carretta@noaa.gov](mailto:Jim.Carretta@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov).



**Left: The RHIB searches for cetaceans in Monterey Bay. Right: Life ring of the NOAA Ship *Reuben Lasker*.**

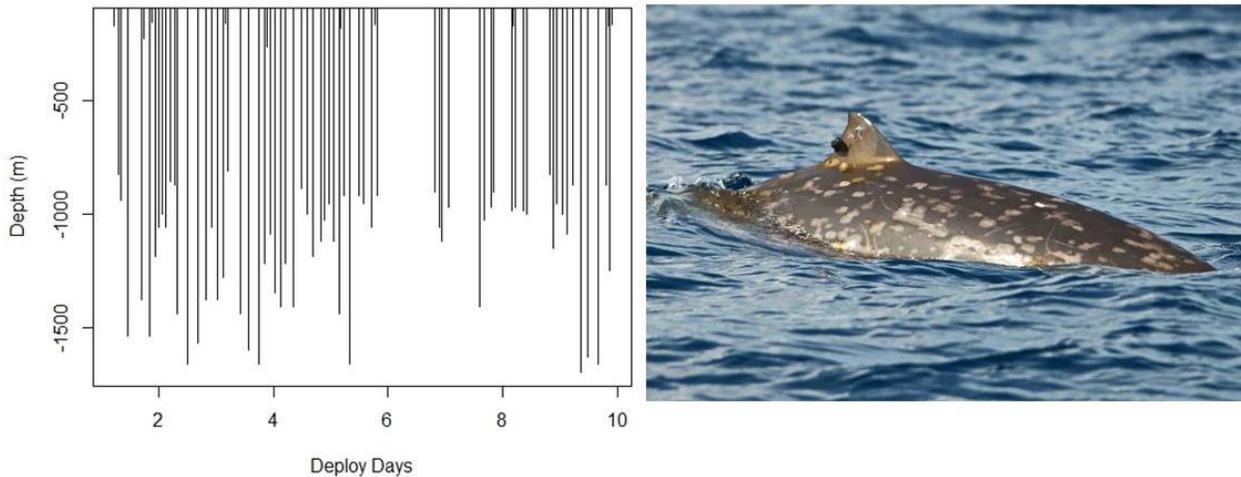
*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* –The summary of the first leg of Expedición Internacional Vaquita Marina 2015 is now posted (<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=676&id=20991>) and includes maps of effort completed and locations of vaquita sightings. Photos and videos from Leg 1 are also posted (<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=676&id=21006>) and include video of vaquitas taken through the ‘big eyes’ by Suzanne Yin with her iPhone, and a time-lapse video showing how observations are done through the ‘big eyes’ taken by Ernesto Vázquez using his GoPro. Leg 2 of the survey began Sunday, 1 November, with some new scientists, including Co-Chief Scientist Dr. Lorenzo Rojas-Bracho (see the survey page for their biographies). A team from Discovery Latin America doing a series on endangered species visited the ship for 2 days. And windy conditions limited effort severely, but better weather is anticipated for this week. Read more about the survey and see photos and video on the Vaquita Expedition 2015 website at <https://SWFSC.noaa.gov/MMTD-vaquita2015> and/or contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) details.



**Left: Lorenzo RojasBracho-, Co-Chief Scientist Vaquita Expedition, at rail being interviewed by Discovery Latin America. Right: Robert Pitman searching for vaquita using “big eye” binoculars. Photo credit: Suzanne Yin.**

*Behavioral Response of Odontocete Cetaceans to Navy Sonar, US Navy's Atlantic Test and Evaluation Center (AUTECE), Bahamas, 24 October – late November* - Breezy weather prevented further whale tagging opportunities this week. However, the four satellite tags deployed last week on Blainville's beaked whales continue to provide movement and diving data into the second week of deployments (see

Figure). This week fleet readiness exercises begin, involving the use of sonar, and these tags will be used to identify and evaluate the extent of displacement and foraging disruption to beaked whales that regularly use the AUTEK range. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



Dive depths (left) of an adult female Blainville's beaked whale, recorded by a small satellite transmitter tag deployed on her dorsal fin (right). The plot shows repeated foraging dives in excess of 1000m (max = 1689m) over the 10 days since tag deployment. Future data from the tag will be used to evaluate any foraging disruption associated with sonar exposure during fleet-readiness exercises. Photograph courtesy of the Bahamas Marine Mammal Research Organisation.

*Green Turtle Ecological Research, San Diego Bay, 5 November* - SWFSC marine turtle researchers were successful in capturing a large adult male green turtle in south San Diego Bay last week. The turtle was in excellent condition and measured 93.5 cm straight carapace length and 125 kg (275 lbs). He was last captured in 2001 and measured only 71.8 cm straight carapace at the time (a size consistent with immature status). Interestingly, based on analysis of blood samples collected in 2001, in early 2014 Camryn Allen conducted the hormone analysis and determined that this turtle was a male. This record was included in her recently published paper in PLoS One and provides yet another example of the value of hormone studies to examine sea turtle sex ratios in the wild! In addition to measurements and tissue sampling, the turtle was equipped with an ARGOS-linked GPS transmitter (photo) as part of a collaboration with the Unified Port of San Diego and U.S. Navy. This is the 4th such transmitter to be deployed this year. Contact PIs [Robin.LeRoux@noaa.gov](mailto:Robin.LeRoux@noaa.gov), [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov), or [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.



Left: Transmitter placed on green turtle. Right: Turtle being gently returned to the water by Tomo Eguchi (back) and Jeff Seminoff (front). Photo credit: Ralph Pace; photos taken under NOAA Permit 16803.

*Week of 2 November 2015*

*Collaborative (SWFSC/AFSC) Large Whale Survey (CLaWS), West Coasts of U.S. & Canada, 9 July - 9 November* - NOAA Ship *Reuben Lasker* departed Port Angeles, WA on 26 October to begin the final leg (#5) of the survey. Cruise leader Jim Carretta is joined by Nick Kellar, Bernardo Alps, Amy Van Cise, Melanie Good, Alisa Schulman-Janiger, and Angelica Patyten. Gray whales were located in the area around Cape Flattery on the first day of effort and 3 biopsy samples and a handful of photographs for individual identification were obtained before the weather prevented further sampling. Later that day, the winds calmed and a group of Bigg's (transient) killer whales were located, from which one biopsy sample was obtained, along with several photographs for individual identification. Alisa-Schulman Janiger confirmed that female T075B (shown below) was present in this group. This animal is known to have had at least two calves. Later in the week, we encountered approximately 15 gray whales in the vicinity of Cape Blanco, OR. The small boat was launched and the team returned with 6 biopsy samples and many more identification photos. Signs of mating behavior were apparent in this group and it was clear that the whales were utilizing this area that day, with no signs of southward migration. The Cape Blanco area is beautiful - Bernardo Alps captured the essence of the region in a series of photos, with two of our favorites below and now appearing on NOAA Ship *Reuben Lasker* Facebook page. *Reuben Lasker* is working its way south towards Point Conception, where we expect to find, among other things, offshore bottlenose dolphins near the northern Channel Islands. Details of this project can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861> and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Jim.Carretta@noaa.gov](mailto:Jim.Carretta@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov).



**Gray whale spyhopping at left with NOAA Ship *Reuben Lasker* in background. At right, gray whale surfacing off the coast of Oregon. Photos taken by Bernardo Alps under NOAA Permit No. 14097.**

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* - Windy conditions largely limited effort last week (the last week of Leg 1) but on the last day of this leg, three vaquita sightings were made. The total number of confirmed vaquita sightings for this 32-day leg was 15 along 593 nm of search effort, consistent with past data estimates of a very small population. All 2015 sightings have been made in the same area as sightings on previous surveys (1993, 1997, and 2008). Also of note for Leg 1, the Mexican Navy is clearly enforcing the ban on gillnet fishing in the range of the vaquita, as there were few fishing vessels sighted in this region. The first leg of

Expedicion Internacional Vaquita Marina 2015 ended on 28 October, when the scientists disembarked in San Felipe, Baja California Norte for a brief break from at-sea life, and the *Ocean Starr* proceeded to Guaymas to re-fuel and re-provision for Leg 2. Read more about the survey and see photos and video on the Vaquita Expedition 2015 website at

<https://SWFSC.noaa.gov/MMTD-vaquita2015> and/or contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) for details.



**Vaquita photographed in the Upper Gulf of California, October 2015.**

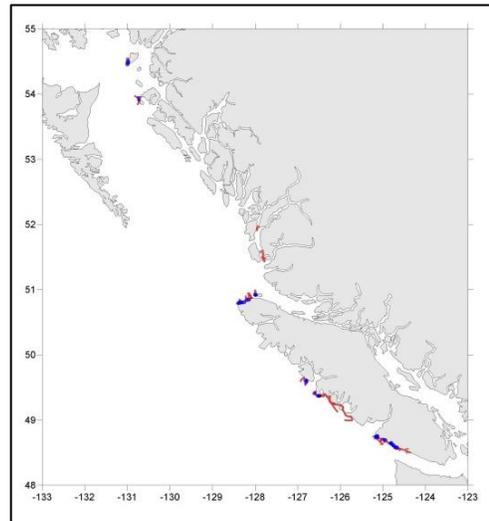
*Behavioral Response of Odontocete Cetaceans to Navy Sonar, US Navy's Atlantic Test and Evaluation Center (AUTECE), Bahamas, 24 October – late November* - Four Argos satellite transmitter tags were deployed on Blainville's beaked whales (*Mesoplodon densirostris*) last week, an exciting accomplishment for the first week of the project. These small LIMPET tags will transmit for a period of weeks, providing key data on the movement and diving behavior of these elusive whales, to assess their behavioral response to sonar exposure during fleet readiness exercises. These tags contribute to a database from 22 tag deployments on this species since 2009, to enable comparison of behavior both in the presence of sonar and during quiet times. This has been a long and challenging field effort, and this successful achievement has required great patience from a very committed team of collaborators: MMTD, the Bahamas Marine Mammal Research Organization and the US Naval Undersea Warfare Center, with funding from then US Navy's Living Marine Resources Program. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).

*California Sea Lion Census & Diet Research, Channel Islands, Southern California Bight, quarterly* - On 2-4 November, Mark Lowry will be accompanied by two distinguished field assistants, Cisco Werner and Kristen Koch. They will travel to San Nicolas Island to collect California sea lion scat samples for diet analysis. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for information.

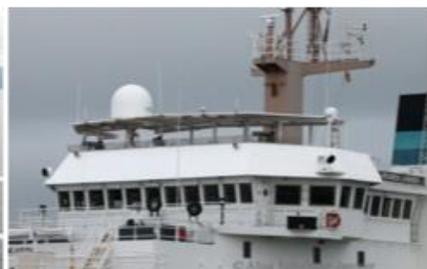
*Week of 26 October 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* – Last week’s final week of CLaWS’ leg 4 was another successful one for the team aboard NOAA Ship *Reuben Lasker*.

The team located and documented gray whales along the northern and southern shores of Vancouver Island, and using the ship’s rigid hulled inflatable boat (RHIB), added 25 new gray whales to the CLaWS photo-identification catalog and 14 skin and blubber samples. These additions bring the total number of gray whales photographically identified during leg 4 to 87 with 58 of them with skin and blubber samples for future molecular analyses. In addition to spending more than half of Leg 4’s days at sea in the RHIB documenting gray whales, the team surveyed approximately 450 nautical miles of British Columbia’s coastal waters and recorded 132 sightings of cetaceans. The cetacean species identified included humpback, fin and killer whales, Dall’s and harbor porpoises, and Pacific white-sided and northern right whale dolphins. Photographs of humpback and killer whales will contribute to on-going research documenting the whereabouts and longevity of known individuals in the populations of these species. The killer whales were sighted just north of Calvert Island, British Columbia in Hecate Strait and have been identified as members of the northern resident’s “I-11” matriline. NOAA Ship *Reuben Lasker* is now preparing for Leg 5, the final leg of CLaWS. A new team of scientists will join the ship for this leg, and Jim Carretta will be the Cruise Leader. Details of this project can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



*Map of British Columbia, Canada showing where the small boat worked during CLaWS Leg 4 (red) and where gray whale photographs and tissue samples were collected (blue).*



One of this week’s highlights was a spy hopping gray whale observed while photographing whales from the small boat (left). The Leg 4 scientific team (center) included Bingyao Chen, Paul Fiedler, Susan Chivers (L-R, back row), Sergio Martinez, Alisa Schulman-Janiger, Karin Forney, and Alicia Amerson (front row). Survey effort was conducted from the flying bridge (top deck under canopy) of the NOAA Ship *Reuben Lasker* using ‘big eye’, 25 x binoculars (right). Marine mammal photo taken under NOAA/NMFS Permit No. 14097. All photos were taken by Alisa Schulman-Janiger.

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3*

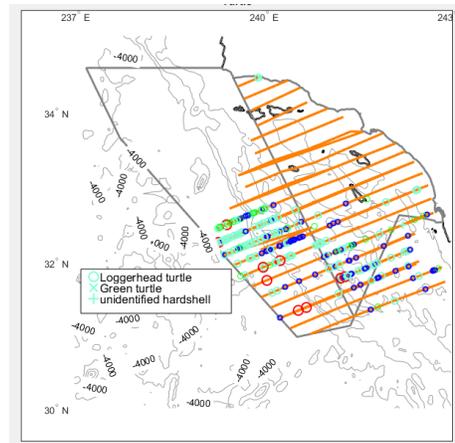


*December 2015* - Three hours of survey effort on 18 October and 5 hours on 22 October were conducted in good survey conditions (Beaufort sea state <3) and two confirmed and three possible vaquita sightings along 84 nmi of trackline effort were made. One of these sightings resulted in

the first good vaquita photographs of 2015 (see photo below). The rest of the week was too windy for useful transect effort in this specialized study. “Possible vaquita” sightings are now being recorded with a special species code and a score that reflects the observer’s confidence in the identification. For each “possible vaquita” sighting, the survey effort is suspended, the ship turned and all observers attempt to relocate the sighting to confirm the identification. (Even with 6 pairs of 25 power binoculars and observers with a cumulative 220 years of experience, relocating vaquita is not always possible.) Contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) and/or visit <https://swfsc.noaa.gov/MMTD-Vaquita2015/>.

**Left: One of a pair of vaquitas showing their characteristic triangular dorsal fin 8.5 miles off San Felipe (seen in background). Photo taken from the R/V *Ocean Starr* by Paula Olson. Right: Same pair of vaquitas (both visible here) taken from a photography boat that can approach vaquitas more closely. Photo taken by Todd Pusser.**

*Loggerhead Turtle Research, Southern California Bight, September-October* - Scientists from the Marine Turtle Ecology & Assessment Program completed an aerial line-transect survey of loggerhead turtles last week. The current warm water conditions have resulted in unprecedented numbers of turtles of this species and the team used a NOAA DeHavilland Twin Otter to look for clusters of turtles (with hopes to conduct in-water work from a small vessel). From the 20<sup>th</sup> to 24<sup>th</sup> of October, 892 nautical miles were surveyed during 3 flights, and 23 loggerhead and 1 unidentified turtles were sighted. The survey totaled 2,627.5 nautical miles and 215 loggerhead turtles. Other species sighted included hammerhead sharks, manta rays, common dolphins, blue whales, and bottlenose dolphins. All planned survey lines were not completed due to periodic high winds, low clouds, aircraft mechanical problems, and military exercises that temporarily closed a large part of the study area, nevertheless the high number of turtles sighted and sampled (from previous weeks) make this project a success. Please contact Chief Scientist [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.



*Figure - Study area, completed track lines (orange), on-effort (blue, light blue, and red circles, indicating small, medium and large turtles, respectively), and an off-effort (green circle) sightings of loggerhead turtles and a green turtle sighting near Santa Barbara (blue +).*

*Behavioral Response of Odontocete Cetaceans to Navy Sonar, US Navy's Atlantic Test and Evaluation Center (AUTECE), Bahamas, 24 October – late November* - Fieldwork has commenced for the final year in this multi-year collaboration between MMTD, the Bahamas Marine Mammal Research Organization and the US Naval Underseas Warfare Center (ongoing since 2009), with funding from then US Navy's Living Marine Resources Program. The focus is on deploying Argos satellite transmitter tags on beaked whales and other odontocetes to monitor their behavioral response to sonar exposure during fleet readiness exercises. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).

*Pinniped Census and Diet Studies, Southern California Bight, 22-28 October* - Mark Lowry is conducting an aerial photographic survey of California sea lions and other pinnipeds at the Channel Islands. The National Park Service (Dept. of Interior) is providing a chartered aircraft for the survey. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for details.

*Week of 19 October 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - This week (the third of Leg 4) started with the NOAA Ship *Reuben Lasker* continuing to shelter from the big low pressure system that brought hurricane force winds and rain to the waters off the

coast of British Columbia. During this time, however, there were several opportunities to observe marine mammals in calm coastal waters of Fitzhugh Sound, including opportunities to photograph approximately a dozen different humpback whales feeding in the Sound and to make a short acoustic recording of their sounds. By Tuesday, the seas were calm enough to return to this leg's primary mission: locating gray whales. The team surveyed the areas off northern Vancouver Island and the mainland coast and islands bordering Hecate Strait, and found gray whales along the north side of Hope Island and the western shores of Dundas and Porcher Islands. Whale densities were much lower here than off southern Vancouver Island. Thirteen 13 individual gray whales were photographed and nine biopsy samples from those photographed were collected. This brings this leg's totals to 64 photographically identifiable gray whales with 44 of them having skin and blubber samples preserved for future molecular analyses. Details of this project can be found at

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**A humpback whale in Fitzhugh Sound, British Columbia (Left); the science team returning to the NOAA Ship *Reuben Lasker* after a day of sampling gray whales from the ship's rigid hulled inflatable boat (Center); gray whales along the shallow, rocky coastal waters of several of British Columbia's coastal islands (Right). Marine mammal photos taken under NOAA/NMFS Permit No. 14097; photographer: Alisa Schulman-Janiger.**

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* - Last week windy conditions allowed limited transect effort but this week conditions were wonderful. Most days had light winds in the morning, increased but still light winds in the middle of the day, and calm conditions again in the afternoon. We covered 369 nmi of trackline, with a total of 173 sightings of marine mammals, including 11 sightings of 19 vaquitas. Consistent with the pattern of past vaquita surveys, most sightings for the week occurred during a single hour on one day. And the week brought other days in great viewing conditions with no vaquita sightings. This highly clumped distribution is one of the reasons it is difficult to obtain a precise estimate of abundance. On Friday, 9 October, two more people joined the project (an officer in the Mexican Navy, and a fisheries biologist in INAPESCA), and on Tuesday 13 October, four visitors joined for just the day: two from the U. S. Department of State and two from PROFEPA (the environmental enforcement agency within Mexico). Operations are going well and we are ahead of schedule in terms of the number of transect miles we hoped to cover to estimate vaquita abundance. For more information contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) and/or visit <https://swfsc.noaa.gov/MMTD-Vaquita2015/>.

*California Sea Lion Census and Diet Studies, Channel Islands, Southern California Bight, Quarterly* - Mark Lowry and Alex Curtis were on San Clemente Island 16-19 October to collect scat samples for diet analysis and to count pinnipeds. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

*Passive Acoustic Research and Testing, Southern California Bight, 13-15 October* - Last week Jay Barlow led a mini-expedition aboard the *Outer Limits*, a local sportfishing vessel. Three drifting acoustic spar buoy recorders (DASBRs) were deployed about 15 miles offshore of Oceanside to test a new design and to measure ocean noise. Instruments were deployed on Tuesday, 13 October and picked up on Thursday, 15 October. Amy Van Cise, Jeff Seminoff and William Bone were aboard the vessel on 13 October to assist and to search for loggerhead turtles to tag (none were found). Eiren Jacobson aided in

buoy retrieval on 15 October and participated in tests of other acoustic recording devices (Soundtraps). An experiment was conducted by Shannon Rankin and Jennifer Keating on 13 October to test the reception range for deployed sonobuoys using antennas on the 4th floor balcony of the SWFSC. Good DIFAR signals were received at a range of approximately 14 miles. The excellent crew on the *Outer Limits* aided efforts by finding a humpback whale and a group of pilot whales offshore of Del Mar. Photo identifications and recordings were obtained from the pilot whales. Other unusual sightings included jumping manta rays and a particularly high abundance of flyingfish. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for additional information.



**Humpback whale breaching (left) and pilot whales (right) encountered during recent acoustic research and tests off Oceanside, CA. Marine mammal photos taken under NOAA/NMFS Permit No. 14097.**

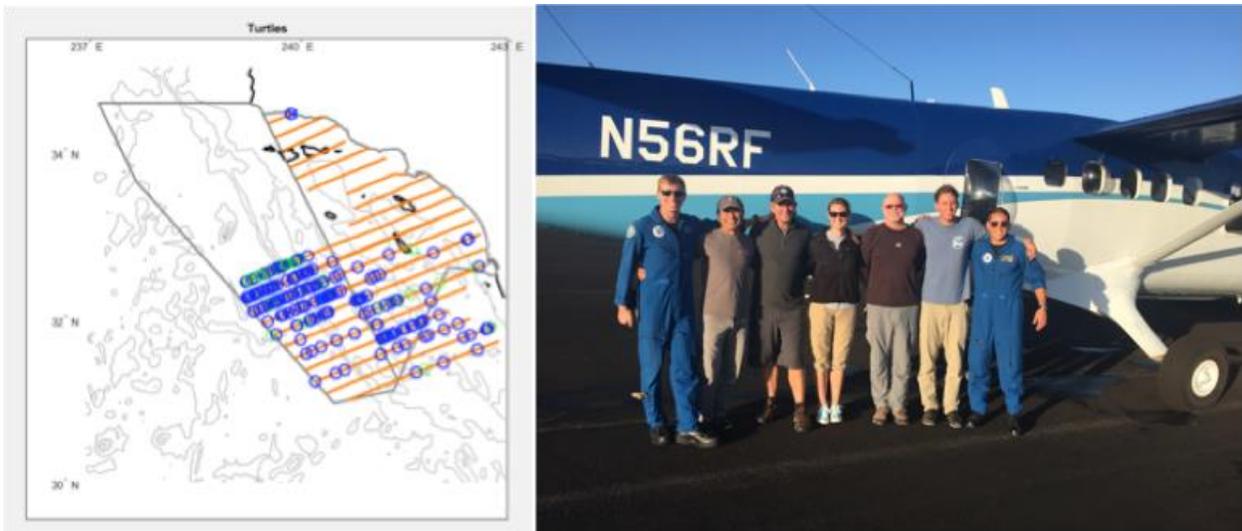
### *Week of 12 October 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - Scientists aboard the NOAA Ship *Reuben Lasker* continued to sample gray whales along the western shore of Vancouver Island last week (the second in Leg 4). Twenty-two gray whales were identified by their distinctive color and dorsal ridge patterns, and biopsy samples were collected from 17 of them. This week's sampling success brings this leg's totals to 51 photographically identifiable gray whales with 35 of them having skin and blubber samples preserved for future molecular analyses. This week's work in the *Lasker's* small boat also provided the team opportunities to collect three acoustic recordings of gray whales that will contribute to characterizing their vocalizations, and two fecal samples that will provide information about their diet. Mid-week, the team repositioned themselves to sample north of Vancouver Island. A half-day survey of the Scott Islands off the northwestern tip of Vancouver Island yielded no gray whale sightings. While conducting this survey, the massive low pressure system developing in the North Pacific brought high winds and rain to the area precluding further work and forcing the ship to seek shelter in the coastal waters of British Columbia. Details of this project can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



Teamwork is essential to at-sea research projects, and all the ship's personnel and scientists work together to collect data. Here, the science team is shown surveying the waters off British Columbia, Canada using 'big eyes' (25x binoculars) to find gray whales (left), processing biopsy samples collected from a small boat launched from the ship (center) and a gray whale surfacing in view of the NOAA Ship Reuben Lasker (right). Marine mammal photo taken under NOAA/NMFS Permit No. 14097; Photo credit: Alisa Schulman-Janiger.

*Loggerhead Aerial Survey, Southern California Bight, September-October* - SWFSC Scientists continue an aerial line-transect survey for loggerhead turtles in the Southern California Bight. The current warm water conditions have resulted in unprecedented numbers of loggerheads within the bight. During the week of 4 October the team surveyed 814 nautical miles in the central offshore and northern coastal portions of the study area (total survey effort to date = 2004 nautical miles). Efforts were based out of San Nicolas Island and the surveys continued to use the 'N-56' NOAA DeHavilland Twin Otter aircraft, flying at 100 knots and 500 ft elevation. A total of 125 loggerhead turtles (and 1 green turtle!) were sighted during the 3 flights, for a grand total of 192 loggerhead turtles seen during 'on effort' flying (and more than 200 total turtles when including turtles observed while 'off effort'). Other species sighted included hammerhead sharks, common dolphins, blue whales, Risso's dolphins, and bottlenose dolphins. Please contact Chief Scientist [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.

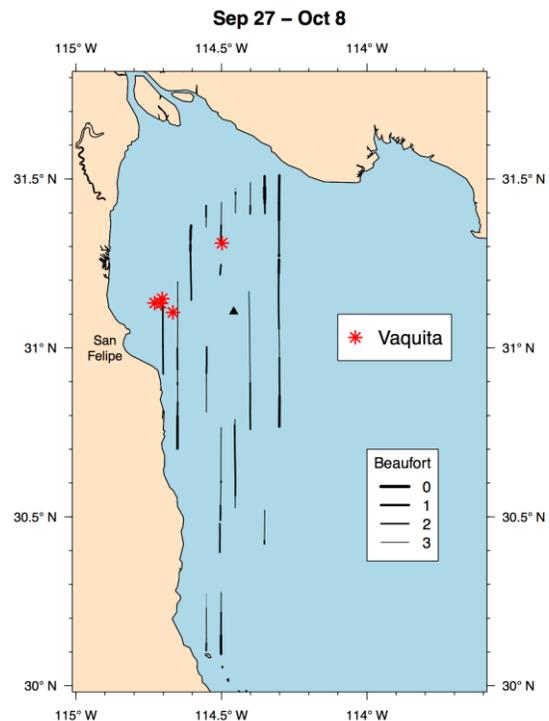


Map of study area (left) - completed track lines (orange), on-effort (blue circles), and an off-effort (green circle) sightings of loggerhead turtles and a green turtle sighting near Santa Barbara (blue +). Survey Team for the week of 4 October (L-R): Kevin Doremus, Tomo Eguchi, Jeff Seminoff, Nicky Beaulieu, Scott Benson, Joel Schumacher, Rick De Triquet.

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 October - 3 December 2015* - Last week was the second of Expedición Internacional Vaquita Marina 2015, a project of the Mexican Ministry of the Environment and Natural Resources (SEMARNAT). Windy conditions limited the time we could search for vaquitas with the “big eyes.” We managed to conduct some survey effort that would be OK for most species (Beaufort 3-4), but we know the probability of detecting vaquitas in such conditions is low. When conditions allowed us to work, we had a total of 32 marine mammal sightings in 43.4 nautical miles (80.4 km) of transect effort, but no vaquitas were seen. The map this week includes sightings and effort from the beginning of the cruise on 27 September through 8 October. We are hoping for better conditions next week.



Observer using big-eyes on the bridge wings with waters empty of fishing gear in background; map of survey tracklines completed with vaquita sightings marked in red.



*Cetacean Passive Acoustics Testing and Loggerhead Turtle Tagging – Collaborative Field Work, Southern California Bight, 13-15 October* - MMTD scientists will conduct this project on a charter survey aboard the R/V *Outer Limits*, a local sport fishing vessel chartered through the NOAA Cooperative Research Program. Jay Barlow will be testing some new designs of his Drifting Acoustic Spar Buoy Recorder (DASBR) system as well as a new autonomous acoustic recorder. Shannon Rankin and Jennifer Keating (ashore) will simultaneously test the range of reception for sonobuoys that will be deployed. Jeff Seminoff will be searching for loggerhead turtles to capture and tag.

### *Week of 5 October 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - During the first week of CLaWS, Leg 4, scientists aboard the NOAA Ship *Reuben Lasker* surveyed from Ketchikan, Alaska to southwestern Vancouver Island recording cetacean sightings along the way. Humpback whales were the most frequently sighted cetacean and accounted for over half of the 55 sightings recorded along the 140 nmi survey track. Fin whales and gray whales were also sighted along with several small cetaceans: Pacific white-sided and Northern right whale dolphin, and Dall’s and harbor porpoises. Weather conditions were calm enough off Vancouver Island for the team to get out in the small boat to sample gray whales. The team collected photo identification photographs of approximately 34 whales and biopsy samples from 20 of the whales photographed. These data will be valuable to on-going

research to understand the movement patterns and stock structure of gray whales in the North Pacific. Details of this project can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**These gray whales were sampled off southwestern Vancouver Island between Hesquiat Peninsula and Pachena Bay this week: 28 September - 3 October. The photographs highlight some of the variability in identifiable characteristics of gray whales and their preference for nearshore coastal waters. Marine mammal photos taken under NOAA Permit No. 14097. Photo credit: Alisa Schulman-Janiger.**

*Expedición Internacional Vaquita Marina 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* -This week marked the beginning of Expedición Internacional Vaquita Marina 2015, a project of the Mexican Ministry of the Environment and Natural Resources (SEMARNAT). The main goal of the project is to estimate the current abundance of the critically endangered porpoise *Phocoena sinus*, the vaquita or Gulf of California porpoise. NOAA scientists from the Southwest Fisheries Science Center, Marine Mammal and Turtle Division, are assisting Mexican colleagues with the line-transect portion of the project aboard the chartered vessel *Ocean Starr*. Lorenzo Rojas-Bracho and Barbara Taylor are the Mexican and U. S. Chief Scientists, respectively.

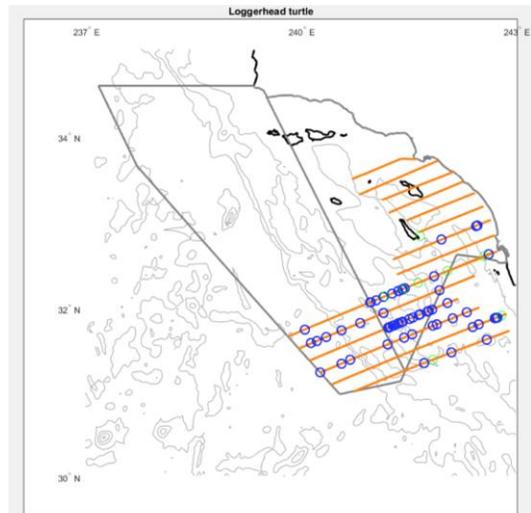
On Friday, 25 September, the international team of 13 scientists on Leg 1 of the survey met at SWFSC for training. The next day the team drove from San Diego to San Felipe and boarded the ship. During the first 5 days, 27 September - 1 October, mostly light winds allowed 193 nautical miles of transect lines to be surveyed and a total of 110 sightings of 5 species to be recorded. The first 4 sightings of vaquitas occurred on 30 September. Three of the sightings occurred close to San Felipe in an area where vaquitas had not previously been seen. Bottlenose dolphins and long-beaked common dolphins comprised most of the dolphin sightings, but there have also been over 30 sightings of whales, both fin and Bryde's.

The first of October was a special day when the ship was visited by a large group of Mexican dignitaries, including the Secretary of SEMARNAT and the Governor of Baja California. In an amazingly fortunate sequence of events, the Mexican dignitaries were able to see vaquitas for themselves through the high-power binoculars. Hopefully the excitement of the day will be the turning point for the survival of the species. Contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) and/or visit <https://swfsc.noaa.gov/MMTD-Vaquita2015/>.



Clockwise from top: Scientists at work on the flying bridge; center right: Secretariat Pacchiano sees his first vaquita; bottom right: Director Aguilar of Fisheries and Aquaculture spots a vaquita; bottom left: Dignitaries enjoying vaquita science; center left: Chief Scientists briefing dignitaries.

*Loggerhead Aerial Surveys and In-water Research, Southern California Bight, September-October* - SWFSC Scientists continue an aerial line-transect survey for loggerhead turtles in the Southern California Bight. The current warm water conditions have resulted in unprecedented numbers of loggerheads within the bight. The team surveyed 767.9 nautical miles in the southern and central inshore portions of the bight this past week, for a grand total of 1,190 nautical miles surveyed so far for the project. A total of 75 turtles have been seen, with other sighted species including hammerhead sharks, common dolphins, blue whales, and bottlenose dolphins. Please contact Chief Scientist [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.



**Study area, completed track lines (orange), on-effort (blue circles), and an off-effort (green circle) sightings of loggerhead turtles.**

### *Week of 28 September 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* – Leg 4 of CLaWS begins this week (28 September) in Ketchikan, Alaska. Twenty-five days of survey effort will be concentrated in waters off British Columbia, Canada. Cruise Leader Susan Chivers (SWFSC) will be joined by scientists: Alicia Amerson, Bingyao Chen, Paul Fiedler, Karin Forney, Sergio Martinez and Alisa Shulman-Janiger. Details of this project can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**After surveying waters off Alaska for Legs 1 -3, the survey will begin working in Canada on 28 September. Left: one of many fin whales encountered on Leg 3. Center: NOAA Ship *Reuben Lasker* off Yakutat, Alaska. Right: the splendid scenery provided by Alaska. Marine mammal photo taken under NOAA Permit No. 14097. All photos were taken by Bernardo Alps.**

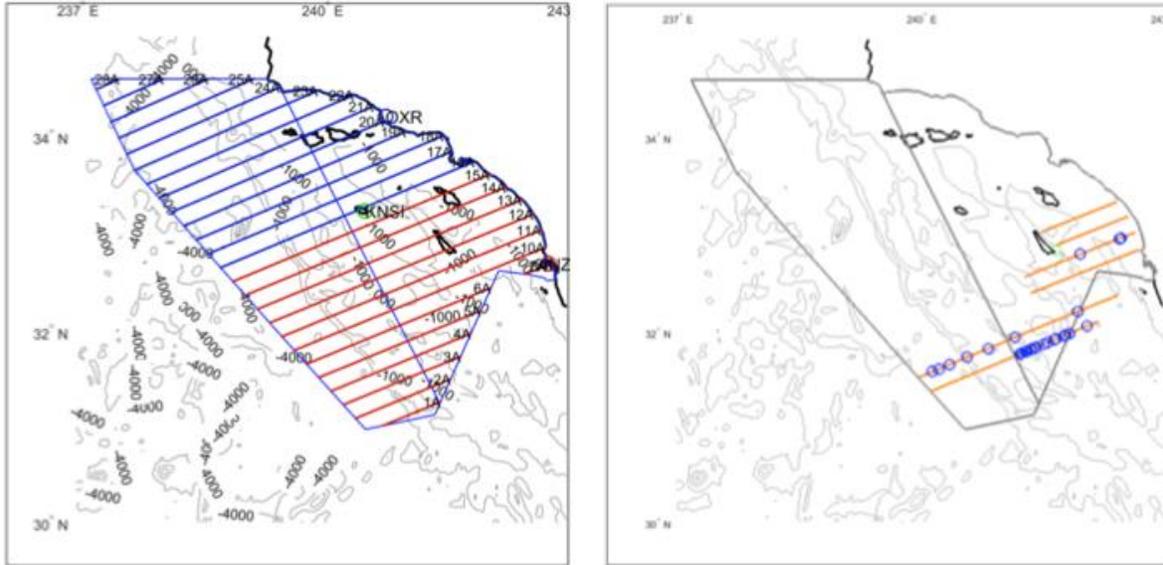
*Vaquita Expedition 2015, Upper Gulf of California, Mexico, 27 November - 3 December 2015* - The Vaquita Expedition 2015 is a collaborative international cruise funded primarily by Mexico (SEMARNAT) with scientists from Mexico, the United States, Germany and the United Kingdom, as scientists on the survey, and as members of an expert panel to analyze data. Vaquita, the Gulf of California porpoise, is the most endangered species of marine mammal in the world. With fewer than 100 remaining, the current survey has special designs to maximize precision in estimating abundance of the population through a combination of visual and acoustic methods. The survey will be conducted aboard R/V *Ocean Starr*. Lorenzo Rojas-Bracho (Mexico) and Barbara Taylor (US-SWFSC) are Co-Chief Scientists. Please contact [Barbara.Taylor@noaa.gov](mailto:Barbara.Taylor@noaa.gov) for details and visit the survey website at <https://swfsc.noaa.gov/MMTD-vaquita/>.



*Loggerhead Aerial Surveys and in-water research, Southern California Bight, September-October* - Scientists from the Marine Turtle Ecology & Assessment Program initiated an aerial line-transect survey of loggerhead turtles in the Southern California Bight this week. The current warm water conditions have resulted in unprecedented numbers of turtles of this species within the bight and the team will use a NOAA DeHavilland Twin Otter to look for clusters of turtles (with hopes to conduct in-water work from a small vessel). Last week, 491.6 nautical miles were surveyed in the southern portion of the study area and a total of 37 loggerhead turtles were sighted in the first two days. Other species sighted included hammerhead sharks, common dolphins, Cuvier's beaked whales, and Risso's dolphins. Please contact Chief Scientist [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.



**Loggerhead aerial survey team (L-R: Lisa Komoroske, Chief Scientist Tomo Eguchi, Joel Schumacher, and Nicky Beaulieu) in front of the NOAA Twin Otter survey aircraft.**



**Left: Study area and planned track lines for the upcoming Southern California Bight aerial survey conducted by SWFSC researchers. Right: Study area, completed track lines (orange), on-effort (blue circles) and off-effort (green circle) sightings of loggerhead turtles.**

*Leatherback Turtle Research, Gulf of Mexico, September 13-26, 2015* - In collaboration with Dr. Chris Sasso (SEFSC) and Dr. Brian Stacey (DVM, F/PR), Scott Benson and Karin Forney participated in the first successful capture and tagging of free-swimming leatherback turtles in the northern Gulf of Mexico. Obtaining data on leatherback turtles in the Gulf of Mexico has been a priority for SEFSC because pelagic longline fisheries regularly interact with this species but little is known about their distribution, movements, or origins. Using coordinated aerial and boat-based capture methods that were first developed off central California, six leatherbacks were successfully captured and tagged, and all transmitters are reporting. Scott provided technical training, advice, and expertise on the capture vessel. Karin led and trained the aerial team aboard NOAA Twin Otter N48RF piloted by Matt Nardi and Alex Johnston. For more information, contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov).



**Scott Benson, Chris Sasso, and the aerial support team for leatherback capture operations: (left to right: Paul Nagelkirk, Scott Benson, Stephani Durkacz, Alex Johnston, Karin Forney, Heidi Malizia, Matt Nardi, and Chris Sasso).**

### *Week of 21 September 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* – The last week of Leg 3 began with a survey of Yakutat Bay, an amazing view of Hubbard Glacier, and numerous harbor porpoise sightings. After leaving the bay, high winds, large swell, and not-so-scattered showers were the norm all along the coast of southeastern Alaska, as were humpback whales, Dall’s porpoises, and harbor porpoises. Just when it began to look like our last week would end on a low note, the skies cleared, the winds died, and fin whale sightings were scattered between Sitka Sound and Dixon Entrance. The last sighting for Leg 3 was a group of approximately 45 fin whales spread throughout a relatively small area within the waters of Dixon Entrance. We collected several biopsy samples, the last of which was set adrift when the line tethering the bolt snapped and our valuable sample temporarily disappeared from sight. The successful retrieval of this sample depended on the coordinated efforts of both scientists and crew and highlighted what a great team we have had on the LASKER for this leg! Details of this survey can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Aimee.Lang@noaa.gov](mailto:Aimee.Lang@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**Left: The Leg 3 scientific team, front row: Elyssa Watford, Nikki Vollmer, Charlotte Boyd, Alyssa Baldo; back row: Eric Archer, Aimée Lang (Cruise Leader), and Bernardo Alps. Right: Stunning Alaskan glacier scenery.**

*Southern Resident Killer Whale Health Assessment, Puget Sound, WA, August - September* - This past week saw the completion of a hugely successful season of whale photogrammetry studies around Vancouver Island. Since early August the collaborative team from MMTD (John Durban and Holly Fearnbach) and the Vancouver Aquarium (Lance Barrett-Lennard) have flown a total of 248 flight missions over whales with an unmanned hexacopter, flying a combined 296 kilometers to collect overhead images. Preliminary analysis indicates that high quality aerial images have been obtained from all individual whales encountered, including 74 Northern Resident killer whales, 20 West Coast Transient killer whales and the entire endangered population of 81 Southern Resident killer whales. These images will be measured to compare growth and body condition across populations to make inference about nutritional status, a key component of recovery plans aimed at maintaining adequate food supplies. The team was joined in the field this week by Lynne Barre from the NOAA West Coast Region, to observe successful flight operations over Southern Resident killer whales and discuss how these photogrammetry data can fill key data gaps to inform management. It has been a very busy, and hugely productive six weeks. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



Left: Holly Fearnbach with the hexacopter (“Mobley”) packed up and ready to ship home after a successful field season; the R/V Skana in the background. Right: Aerial photogrammetry image of J28, an adult female Southern Resident killer whale with her juvenile offspring J46 (6-years old); the robust width profile of J28 suggests that she is likely in the late stages of another pregnancy, and future monitoring will allow an evaluation of reproductive success. Aerial images taken using an unmanned hexacopter at an altitude of >100ft, with research approach authorized by NMFS permit # 16163 and flight authorization under an MOU between NOAA and the FAA (Class G MOU # 2015-ESA-4-NOAA).

*Gulf of Mexico Leatherback Turtle Research, Destin, Florida, 13-26 September* - Scott Benson and Karin Forney are participating as invited experts in this SEFSC-led research to capture and tag free-swimming leatherback turtles in the Gulf of Mexico. Although a pelagic longline fishery regularly interacts with leatherbacks in the Gulf of Mexico, little is known about distribution, movements, or origins of leatherbacks in the Gulf. The project aims to attach satellite-linked transmitters to eight turtles. Scott will provide technical training, advice, and expertise to the SEFSC in-water team, and Karin will provide the same for the aerial team. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.

### *Week of 14 September 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - During the second week of CLaWS Leg 3, we continued our efforts to collect photo-ids and biopsies from gray whales off of Kodiak Island, finding some whales that had been identified in this area during previous weeks of the survey as well as some “new” whales. Then, we headed offshore towards an area where multiple sightings of blue whales were made on Leg 2. Although no blue whales were to be found, we worked a few fin whale sightings before moving closer to shore to avoid an incoming storm. After the storm had passed (albeit leaving behind high swell that made for quite a rocky ride!), we began our transit across the Gulf of Alaska to Yakutat Bay. For the remainder of leg 3 we will survey south to Sitka in the hopes of finding more gray whales, and (time and weather permitting) hope to also spend some time on the shelf break looking for sperm whales. Details of this survey can be found at



Small boat operations to collect photographs and tissue samples of fin whales in the Gulf of Alaska. Photo taken under NMFS Permit No. 14097; photo credit: Charlotte Boyd.

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Aimee.Lang@noaa.gov](mailto:Aimee.Lang@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.

*Southern Resident Killer Whale Health Assessment, Puget Sound, WA, August - September* - This past week was hugely successful for the photogrammetry team from MMTD and the Vancouver Aquarium. The unmanned hexacopter (“Mobley”) was flown for 46 flights, collecting high quality aerial images of 40 individual southern resident killer whales (67 individuals so far for the survey from a population of 81). This included images to measure the size of a neonate calf that was first documented this week by our colleagues at the Center for Whale Research (see photos at <http://www.whaleresearch.com/#!/home-2015/c6o8>). Images of all the whales will be used to measure growth and body condition to make inference about nutritional status, a key component of recovery plans aimed at maintaining an adequate food supply for this endangered population. Additionally, aerial images were collected from seven humpback whales to contribute to an ongoing study of the health of recovering humpback populations worldwide, adding to photogrammetry data recently collected in collaboration with Woods Hole Oceanographic Institute off New England and upcoming studies of humpback whales in Antarctica. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Left:** Photogrammetry team of John Durban and Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) conducting flight operations with a small unmanned hexacopter launched from the deck of the R/V Skana. **Middle:** Aerial photogrammetry image of K21, an adult male Southern Resident killer whale; aerial images can be linked to whales of known age and life history using individually-distinct patterns of saddle patch pigmentation that can be matched to long-term photo-identification catalogs. **Right:** Aerial photogrammetry image of a humpback whale; opportunistic photogrammetry data will contribute to an ongoing study of the health of recovering humpback populations worldwide. Aerial images taken using an unmanned hexacopter at an altitude of >100ft, with research approach authorized by NMFS permit # 16163 and flight authorization under an MOU between NOAA and the FAA (Class G MOU # 2015-ESA-4-NOAA).

### *Week of 7 September 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - During the first week of CLaWS Leg 3, our efforts to collect photo-ids and biopsies from gray whales off of Kodiak were successful as numerous whales were sighted near Ugak Island. After the first couple of days, fog moved into this area and the focus of the survey shifted further offshore, where right whale sightings and recordings have been made. Thus far, the species encountered on Leg 3 include Pacific white-sided dolphins, Dall’s porpoise, killer whales, gray whales, and lots of humpback whales. For the second week, survey effort in areas considered hotspots for gray and/or right whales will continue, followed by (weather permitting) effort further offshore to an area where multiple sightings of blue and fin whales were made last leg. Details of this survey can be found at

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Aimee.Lang@noaa.gov](mailto:Aimee.Lang@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



MMTD/SWFSC PERMIT # 14097 PHOTO BERNARDO ALPS



Gray whales were encountered on the first full day of Leg 3 operations. On the left, NOAA Ship *Reuben Lasker* as seen through the blow of the gray whale. On right: two of the many gray whales encountered in Ugak Bay, Alaska. Photo credits: Bernardo Alps; NMFS Permit no. 14097 (SWFSC).

*Southern Resident Killer Whale Health Assessment, Puget Sound, WA, August - September* - This week the killer whale photogrammetry survey relocated to the waters around southern Vancouver Island and the San Juan Islands (Washington State) for studies of the endangered Southern Resident population. This is the first time we have used the unmanned hexacopter to obtain aerial photogrammetry images for the continued assessment of nutritional status and reproductive success, replacing manned aircraft platforms. This week John Durban and Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) were joined in the field by Wayne Perryman. Despite some challenging weather early in the week, it has been a very successful start: 24 flights over members of all three pods (J, K and L) with good photogrammetry images from an estimated 30 whales from the population of 81. We have a favorable weather forecast and hope to improve on population coverage in the coming two weeks. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



Photo on left: Aerial photogrammetry image of K37, a young male (12-yr old) Southern Resident killer whale. Aerial images can be linked to whales of known age and life history using individually-distinct patterns of saddle patch pigmentation that can be matched to long-term photo-identification catalogs. Photogrammetry is being used to track growth and body condition of individuals to make inference about nutritional status over the long and short-term. Photo on right: Aerial photogrammetry image of a Southern Resident killer whale female J16 with her new calf in its first year; both mother and baby appear in robust body condition despite the challenges of lactation. All images taken using an unmanned hexacopter at an altitude of >100ft above the whales, with research approach authorized by NMFS permit # 16163 and flight authorization under an MOU between NOAA and the FAA (Class G MOU # 2015-ESA-4-NOAA).

*Week of 31 August 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - On 27 August the second leg of CLaWS concluded in Kodiak, Alaska. Under the leadership of Brenda Rone (AFSC/NMML) leg 2 covered nearly 2500 nm, documented 408 sightings of 10 cetacean species, and acoustically recorded 9 species. Highlights of this leg included: gray, blue, fin, humpback, sei, sperm and killer whales and two acoustic contacts of right whales. Based on what has been learned during legs 1 and 2, NOAA Ship *Reuben Lasker* will continue working off Kodiak for about 10 days at the beginning of leg 3, working with gray whales (near locations where they were found on legs 1 and 2), and searching for right whales and blue whales in the areas where they were heard or sighted during leg 2. Having the *Lasker* in the Kodiak area will also provide eyes on the water with respect to monitoring the current Large Whale Unusual Mortality Event (UME) in western Gulf of Alaska. Dr. Aimée Lang (SWFSC) is the cruise leader and will be joined by scientists: Eric Archer, Charlotte Boyd, Bernardo Alps, Alyssa Baldo, Nikki Vollmer, and Elyssa Watford. Details of this survey can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Brenda.Rone@noaa.gov](mailto:Brenda.Rone@noaa.gov), [Aimee.Lang@noaa.gov](mailto:Aimee.Lang@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**On left: Survey track of the LASKER during Leg 2, 6-27 August 2015. At right: "Brownell's type" Pacific white-sided dolphin photographed during leg 2. Bob Brownell (SWFSC) first described this anomalous color pattern in a 1965 publication. Photo credit: Bernardo Alps.**

*2015 Health Assessment of Resident Killer Whales, Vancouver Island, Canada, August – September, Week 3 report* - This week saw the completion of the first leg of the 2015 killer whale health assessment using a small unmanned hexacopter. The research team of John Durban and Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) completed photogrammetry sampling of Northern Resident killer whales off northern Vancouver Island. A further 15 Resident (salmon-eating) killer whales were photographed this week that were new for this 2015 survey, contributing to a total of 74 different individual Northern Resident whales and 14 (mammal-eating) Bigg's Transients for the year. Notably, 45 of these whales were also imaged in 2014, which will allow an inter-annual comparison of body condition and pregnancy rates relative to changes in the abundance of their preferred Chinook salmon prey. The mammal-eating Transients will provide a further comparison from a population that is not thought to be food-limited, and has been increasing in abundance over the past four decades. The survey now relocates to the waters around southern Vancouver Island and the San Juan Islands (Washington State) for September, where the hexacopter will be used to obtain aerial photogrammetry images of the endangered Southern Resident killer whale population for a comparative assessment of nutritional status and reproductive success. For more information, contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



Left two photos: Overhead images documenting wound healing of A95, a juvenile Northern Resident killer whale with a fresh wound on its flank (probably propeller strike). Photographic characterization of the wound and the whale's body condition will provide a basis for follow-up assessments of wound healing and health. Images taken using an unmanned hexacopter at an altitude of >100ft above the whale. At far right: Aerial photogrammetry image of four juvenile Northern Resident killer whales. Image taken using an unmanned hexacopter at an altitude of >100ft above the whale. Photographs permitted in Canada under the Species at Risk Act (Marine Mammal License 18) and flight authorization from Transport Canada (SFOC #10854645).

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, Central Tropical Pacific, 2 July - 30 August - On*

August 22 the Yushin-Maru No. 3 finished the designated IWC tracklines for the cetacean survey adjacent to the northwestern Hawaiian Islands. On Sunday, 23 August the research vessel began the long transit (1680 nmi) to the port of Shiogama, Miyagi Prefecture, Japan. The original research plan was to survey to the WNW in passing mode to attain cetacean geographic distribution data on the transit line back to Japan. Fate would have it...Typhoons Atani and Goni led interference and for most of the week the ship was in 10-15 foot seas and high winds. Air temperature ranged between 28.2 °C and 31.7 °C, and sea surface temperature 29.2 °C to 31.1 °C. The total searching distance for the week was 265.9 nmi. Sightings for the week (some with biopsy samples also collected) included Bryde's whale, and rough toothed and pantropical spotted dolphin. The ship arrived at the port of Shiogama, Japan on Sunday morning (30 August) at 0900 hrs. The survey final report is in draft form and Jim Gilpatrick (MMTD) will work with Dr. Matsuoka at the Institute of Cetacean Research (ICR) in Tokyo on 31 August to finalize the draft report for IWC review. Contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov) for information.



Loggerhead turtle on its journey to a nesting beach in Japan.

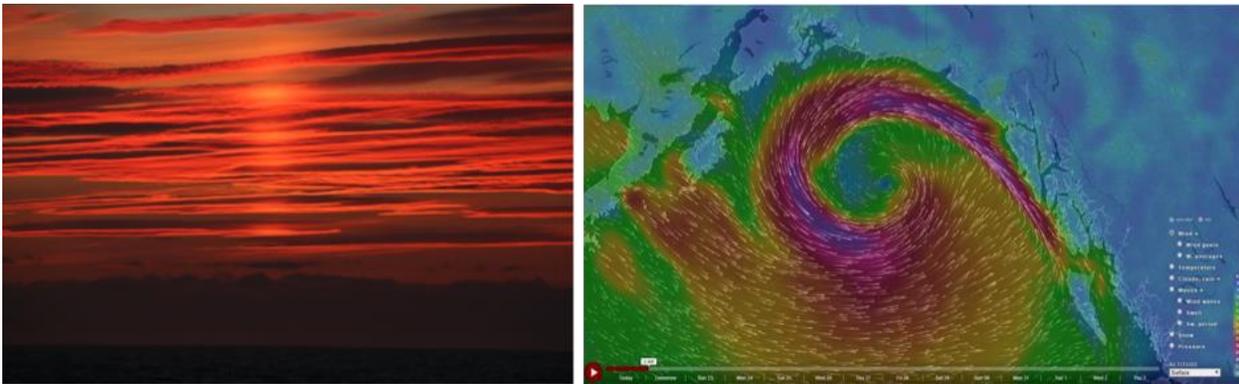
*Southern California Green Turtle Monitoring Efforts* - The Marine Turtle Ecology and Assessment Program conducted green turtle monitoring efforts in the Long Beach area (Seal Beach National Wildlife Refuge and San Gabriel River) on 8/25 and 8/26 and in San Diego Bay on 8/27. Efforts in Long Beach are conducted in collaboration the West Coast Regional Office (Dan Lawson and Tina Fahy). Five green turtles were caught at the Seal Beach Wildlife Refuge, none of which has been caught before. Lengths of these turtles ranged from 51.5 to 72.6 cm straight carapace length (SCL), whereas mass ranged from 18 to 45 kg. In San Diego Bay, three turtles were caught; two of which were recaptures from previous years. Their lengths ranged from 75.2 to 102.5 cm SCL and mass from 66 to 152 kg. As part of a collaborative project with the Navy, three GPS-enabled satellite transmitters were deployed on the three turtles in San Diego Bay. Biological samples (blood, skin, etc.) were collected from each of the captures. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for details.



**Tomo Eguchi (on left) and Dan Lawson release one of the five juvenile green turtles caught in the Seal Beach National Wildlife Refuge.**

## Week of 24 August 2015

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November* - During the second week of Leg 2 of CLaWS, the survey continued effort within offshore waters and then worked back inshore to avoid weather. Once again, a right whale was acoustically detected in Barnabas Trough but inconsistent calling hindered location of the individual. A humpback carcass was documented and photos and information were immediately sent to the Stranding Network. After losing two days to a gale, the survey continued north within the shelf/slope waters and completed six transects in excellent conditions before heading inshore to the Kenai Peninsula to avoid the second gale of the week. Species sighted during this second week were sperm whales, sei whales, fin whales, humpback whales, killer whales, and Dall's porpoise. Details of this survey can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Brenda.Rone@noaa.gov](mailto:Brenda.Rone@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**Left: Red sky at night actually brought two days of delight. Right: Gale number two for the week.**

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, Central Tropical Pacific, 2 July - 30 August* - On Saturday, 22 August at 1310 hrs (local ship time), R/V *Yushin-Maru No.3* (YM3) completed the survey of all designated track lines within the main study area. In summary: since 7-July-2015 (when the YM3 entered the main survey area) approximately 5,010 nmi have been surveyed for cetaceans around the NW Hawaiian Islands. The ship is currently in searching mode at 11.5 kts speed on a 295° WNW direct course towards the Port of Shioyama, Japan (1,650 nmi distance). The YM3 is expected in Shioyama on 30-August and a complete summary cruise report is forthcoming. The ship will transit across a very active Typhoon corridor near Japan in 4-5 days and all hands are standing-by! Sightings for the week included Bryde's whales (*Balaenoptera edeni*, including a calf with a nylon rope draped through its mouth and further entangled along the anterior dorsum), Cuvier's beaked whales (*Ziphius cavirostris*), and 1 unidentified Ziphiidae. Biopsy samples and photographs were collected from some. Seabird sightings (many photographed) of interest included: Masked and Brown Boobies, White and Sooty Terns, Hawaiian, Cook's and Juan Fernandez Petrels, Red-tailed Tropicbirds, Wedge-tailed Shearwaters, Black-footed Albatrosses, and 2 shorebirds (sandpiper and godwit types). Contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov) for additional details.

*2015 Health Assessment of Resident Killer Whales, Vancouver Island, Canada, August – September, Week 2 report* - The collaborative team from MMTD (John Durban and Holly Fearnbach) and the Vancouver Aquarium (Lance Barrett-Lennard) completed 23 flights with an unmanned hexacopter, and obtained measurement images from 8 new whales from the Northern Resident (salmon-eating) population that were not photographed in week 1 (59 whales total for the survey) and two new individuals from the West Coast Transient (mammal-eating) population (14 whales total). Additionally, repeated photographs were collected from many of the 73 previously photographed whales to enable improved photogrammetry measurements that show the whales in flatter orientations (less bias for length measurements) and clearer definition of body shape for condition assessment. On four days where wind conditions prevented hexacopter operations, the team conducted photogrammetry from the boat using a laser-range-finder mounted on a digital SLR to measure the blowhole-dorsal fin length of surfacing whales to augment measurements from the hexacopter (Photo 3). Of note, a fresh injury (probable propeller strike) was documented on a juvenile Northern Resident killer whale (individual A95; Photos 1 and 2 attached).

Aerial images documented the extent of the injury and will enable follow-up monitoring of wound-healing and long-term health of this whale. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

**Photos 1 and 2:** Overhead images of A95, a juvenile Northern Resident killer whale with a fresh wound on its flank. Photographic characterization of the wound and the whale's body condition will provide a basis for follow-up assessments of wound healing and health. Images taken using an unnamed hexacopter at an altitude of >100ft above the whale, permitted in Canada under the Species at Risk Act (Marine Mammal License 18) and flight authorization from Transport Canada (SFOC #10854645).



**Photo 3:** Lateral photogrammetry image of A60, and adult male Northern Resident killer whale. Images taken from the boat using a digital SLR camera coupled with a laser-rangefinder system are being used measure the blowhole-dorsal fin length of surfacing whales to augment measurements from the hexacopter. Boat approach permitted in Canada under the Species at Risk Act (Marine Mammal License 18).

*Week of 17 August 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLAWS), west coasts of U.S. & Canada, 9 July - 9 November -*

During the first week of Leg 2, the survey covered the shelf/slope waters from Barnabas Trough and to the south of Kodiak. A right whale was acoustically detected in the Trough but inclement weather along with inconsistent calling hindered location of the individual. The survey will plan to return to Barnabas Trough later this week. The survey then headed into offshore waters where the majority of the illegal Soviet catches of North Pacific right whales occurred in the 1960s. Although right whales have not yet been detected in this offshore region (neither visually or acoustically), a surprising number of blue whales were documented (12 individuals). Photographs and genetic samples were collected from two individuals and calls were recorded on all sonobuoy deployments. Additional species sighted during this first week were sperm whales, sei



**One of a dozen blue whales seen and documented last week on CLAWS.**

whales, fin whales, humpback whales, killer whales, and harbor and Dall's porpoise. Details of this survey can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Brenda.Rone@noaa.gov](mailto:Brenda.Rone@noaa.gov), or [annette.henry@noaa.gov](mailto:annette.henry@noaa.gov) for additional information.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June - August -* The main goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Field work also includes nest protection activities that are coordinated with Sandy Point National Wildlife Refuge staff to enhance conservation goals as well as independent projects carried out by interns, students and volunteers that are part of the field team headed up by Kelly Stewart. Last week was the final in the 2015 season and in the seven years of the project, over 35,000 hatchlings have been sampled. Preliminary research results will be forthcoming in the next months, after the field team returns to the molecular genetics laboratory in La Jolla. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

*IWC POWER Survey, Central Tropical Pacific, 2 July - 2 August -* Week six brought the R/V *Yushin-Maru No.3* south of the Northwestern Hawaiian Islands and progressing northwest, crossing the date line into the Eastern Hemisphere on 9 August. Jim Gilpatrick is aboard the vessel and reports Bryde's and sperm whales, rough-toothed, bottlenose, spotted, and Fraser's dolphin sightings, with photographs and biopsy samples collected from some. Weather conditions were generally good; air temperature ranged between 28.3°C and 32.4°C, and sea surface temperature ranged between 28.6°C and 31.2°C. The total searching distance for the week was 644.3 nmi. Contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov) for additional details.

*Health Assessment of Resident Killer Whales, Vancouver Island, Canada, August - September -* Last week, and the first week of killer whale health assessment off northern Vancouver Island this season, brought a successful start to this effort. The research team of John Durban and Holly Fearnbach (MMTD) and Lance Barrett-Lennard (Vancouver Aquarium) completed 73 flights with an unmanned hexacopter (>13 hours of flying), obtaining photogrammetry images from all killer whales encountered. This included 51 individuals from the Northern Resident (salmon-eating) population and 12 individual West Coast Transients. Preliminary examination of the photographs indicates that the whales are generally in robust condition. Upon completion of the analyses, these photogrammetry data will be used to infer the nutritional status and reproductive success of Northern Resident killer whales, relative to the abundance of their preferred prey (Chinook salmon), to provide a key comparison to the status of endangered Southern Resident killer whales which will be measured during follow-on studies in September around southern Vancouver Island. The mammal-eating Transients will provide a further comparison

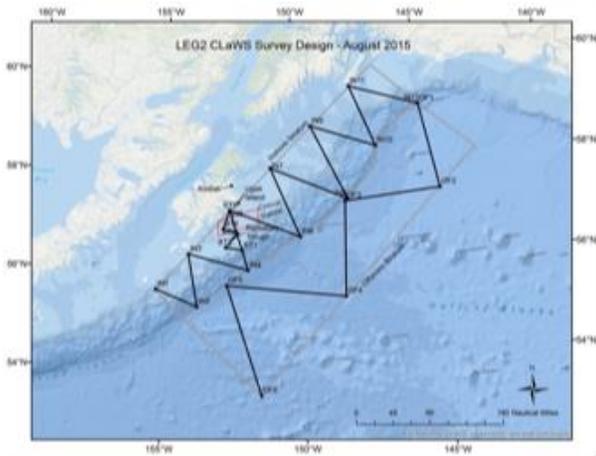
from a population that is not thought to be food-limited, and has been increasing in abundance over the past four decades. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



On left: High-quality photogrammetry image of the A42 matriline of Northern Resident killer whales. These whales were also imaged in 2014, enabling a comparison of body condition across years to infer changes in nutritional status. On right: Mammal-hunting Transient killer whales searching for seals close shore.

### *Week of 10 August 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLaWS), west coasts of U.S. & Canada, 9 July - 9 November -* Leg 2 of CLaWS departed Kodiak, Alaska, on the afternoon of August 6th. Unfortunately, the atypical good weather of Leg 1 ran out for us. With the exception of Friday morning, winds have been high everywhere except at the mouth of Ugak Bay. We encountered 4 grays Thursday evening, too late to launch the skiff but we were able to photograph all. First thing Friday morning, we encountered 4 grays (some repeats from Thursday night) and managed to collect biopsy samples. That was the extent of our gray whale/small boat opportunities for the next two days. We headed back to the mouth of Ugak Bay where we could get a lee to work and only found humpbacks. We were able to locate a group of 4 grays a little offshore and just southeast of Ugak Island. One new animal was documented and then the weather closed in. We managed to contribute 6 new photographed individuals and 2 new biopsy samples to the project. The scarcity of gray whales in the area is surprising. In recent years, from 30 to 50+ animals have been seen in the area. The science team has, however, run into the typical smattering of humpbacks as well as Dall's porpoise. Jessica Crance (acoustician) is running continuous acoustic coverage of Barnabas Trough region. This is an area where a majority of the right whale sightings and acoustic detections have occurred in recent years. If right whales are encountered, attempts will be made to photo-identify, biopsy sample and satellite tag them. Data will also be collected on other large whales (e.g. potentially blue, fin and sperm whales). The scientific team on Leg 2 includes Brenda Rone (AFSC/NMML Chief Scientist), Robert Pitman, Sergio Martínez, Bernardo Alps, Tory Johnson, Amelia Burke, Kelly Cates, Megan Slack, Kelsey Miller, Jessica Crance, Nick Tucker, Kelly Beach, and Tony Martinez. Details of this survey can be found at <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=276&id=20861>. Contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov), [Brenda.Rone@noaa.gov](mailto:Brenda.Rone@noaa.gov), or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**Left: Survey tracklines for Leg 2 of CLaWS, focusing on North Pacific right whales. Right: Photo-identification and biopsy sampling of gray whales off Ugak Bay, Kodiak Island, Alaska.**

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, Central Tropical Pacific, 2 July - 2 August* - Week five of the survey found the Yushin-Maru No. 3 in consistent trade winds ranging from 17-22 kts. The total searching distance for the week was 272.7 nmi. Four and a half days of survey time were lost due to high winds and choppy seas. Sightings were relatively low during week five of the survey and included Bryde's whale and rough toothed dolphins, including 4 mother-calf pairs.

*Health Assessment of Resident Killer Whales, Vancouver Island, Canada, August – September* - This week will see the beginning of our annual photogrammetry monitoring of the health of Resident killer whales. For the remainder of August, John Durban and Holly Fearnbach (MMTD) will partner with Lance Barrett-Lennard (Vancouver Aquarium) to use a small, unmanned hexacopter to collect overhead images of Northern Resident killer whales off northern Vancouver Island. These images will be used to assess growth, current body condition, and identify pregnancies in individually-recognizable whales. These data will be used to infer the nutritional status and reproductive success of this population, relative to the abundance of their preferred prey (Chinook salmon), to provide a key comparison to the status of endangered Southern Resident killer whales. The team will then conduct parallel research on the Southern Residents around the San Juan Islands, Washington, in September. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).



**Research team (left to right): John Durban, Holly Fearnbach (MMTD hexacopter flight team) and Lance Barrett-Lennard (Vancouver Aquarium).**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June - August* - The main goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Our field work also includes nest protection activities that are coordinated with Sandy Point National Wildlife Refuge staff to enhance conservation goals as well independent projects carried out by interns, students and volunteers that are part of the field team headed up by Kelly Stewart.



**Left: Team members Claire Gonzales, Christina MacMillan and Shreya Banerjee who have spent the summer working hard with our team. Right: Hatchlings make their way to the water after sunset. Photo credit: Claire Gonzales**

It's been a good week for field sampling and we've nearly reached 5,000 samples for the season, making our total well over 35,000 hatchlings sampled for the project since its inception. Erin LaCasella joined the team this week along with former STAR Teacher Researcher Shane Morales and volunteer Victoria Pich. Sunday, former STAR teacher researcher Violet Campbell and volunteers Christella and Iris Campbell will join the team. Student projects have been finished as we head into our last week of sampling (which should end August 14). Christina MacMillan will present her results next week at the STAR closing conference in the Bay area. She's presenting on trash and Sargassum surveys that she did this summer. Luckily the Sargassum has abated and the water has become clear again. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

### *Week of 3 August 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLAWS), west coasts of US & Canada, 9 July - 9 November - From 20-31 July, CLAWS onboard the NOAA ship Reuben Lasker (<http://www.moc.noaa.gov/rl/>), surveyed waters between Yakutat and Ugak Bay, Alaska. Visual observations and small boat efforts documented gray, fin and humpback whales, Dall's and harbor porpoise and killer whales. Leg 1 (of 5) ended on 31 July. Leg 2 (led by AFSC, with field and shore support from SWFSC) begins in Kodiak, Alaska on 6 August with a primary focus on highly endangered North Pacific right whales. Contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov), [brenda.rone@noaa.gov](mailto:brenda.rone@noaa.gov), or [annette.henry@noaa.gov](mailto:annette.henry@noaa.gov) for details.*



**A feeding gray whale in Ugak Bay, Alaska, with NOAA Ship Lasker standing by in the background.**

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, Central Tropical Pacific, 2 July - 2 August* - The survey aboard the Japanese ship *Yushin-Maru no.3* (YM3) continued this week in the tropical central North Pacific, with Jim Gilpatrick aboard as the US observer. A total of 605 nmi of trackline were covered, generally to the west and 60-80 nmi south of the Papahānaumokuākea Marine National Monument area. Approximately 16 hours (out of 80 hours planned) of survey time was lost due to rain and high winds. Air temperatures ranged between 23.3 - 31.5 °C, sea surface temperatures between 27.2 - 29.5 °C, and Beaufort sea state between 2-5 in the northeasterly trade winds of the NW Hawaiian Islands. The YM3 transited out of the US EEZ (on 1 August, 2015 at coordinates: 23° 32.3' N/176° 28.6' W) and will continue to survey to the SW and to the NW and away from the NW Hawaiian Islands. Contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov) for additional information.



A Masked Booby (with leg band tag) and Wedge-tailed Shearwater share some mid-day raft time 100 nmi SW of French Frigate Shoals.



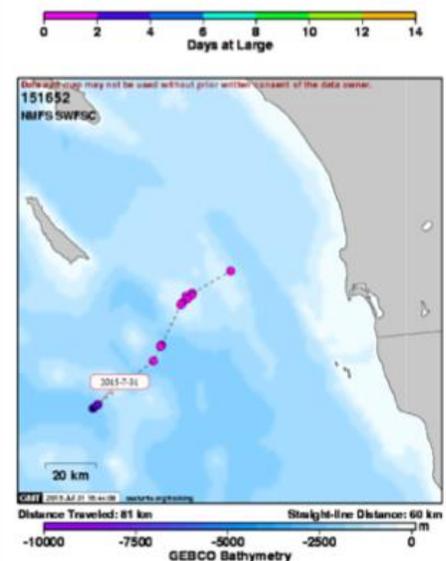
Fraser's dolphins (*Lagenodelphis hosei*) displaying typical size-class differences in color morphology.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June - August* -The main goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Our field work also includes nest protection activities that are coordinated with Sandy Point National Wildlife Refuge staff to enhance conservation goals as well independent projects carried out by interns, students, and volunteers that are part of the field team headed up by Kelly Stewart. To date, 4,213 hatchlings from ~150 clutches laid by 63 females (~75% of the females that nested this year) have been sampled. Nine of these females are first time nesters, 13 nested 2 years ago, and 8 nested 3 years ago. About 50% of the females sampled this year have not been sampled in the last 3 years. Because our team samples hatchlings from at least 75% of the females each season, it is likely that many of the females have not nested here since before 2012. Erin LaCasella joins the team this week as well as former STAR intern Shane Morales and volunteer Victoria Pich. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).



Left: The team helps rescue a nesting hawksbill turtle that had become disoriented and was still on the beach at 8 am. Center: STAR Teacher Researcher Christina MacMillan surveys the worst week of Sargassum inundation this season. Right: Green turtles have started nesting at Sandy Point as confirmed by a recent green turtle track in the refuge.

*Loggerhead Turtle Research Cruise in the Southern California Bight (SCB), 26-28 July 2015* - Following a report of hundreds of loggerhead turtles sighted during the previous week and serendipitous availability of a sportfishing vessel, *Outer Limits*, eight scientists from Marine Turtle Ecology & Assessment Program and Marine Turtle Genetics Program conducted a two-day cruise in the Southern California Bight to tag loggerhead turtles with satellite transmitters. Although the patch of turtles was not found, six loggerhead turtles were sighted and two were captured, a first for loggerheads in the SCB. There were of different age classes, with lengths of 20.5 (less than a year old, indicating it traveled from a nesting beach in Japan after hatching last year) and 57.6 cm (likely over 5 years old). The large turtle was equipped with a satellite transmitter. For more information, contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov).



Left: Loggerhead turtle in hoop net aboard the charter vessel *Outer Limits*. Right: Map of satellite-tracked movements of “Matteo,” a 57.6 cm loggerhead turtle captured during recent at-sea research by SWFSC scientists. The turtle was captured and released on 28 July 2015.

*Week of 27 July 2015*

*Collaborative SWFSC/AFSC Large Whale Survey (CLAWS), west coasts of US & Canada, 9 July – 9 November – From 20-25 July, CLAWS, a joint field effort by Southwest Fisheries Science Center and Alaska Fisheries Science Center onboard NOAA ship REUBEN LASKER (<http://www.moc.noaa.gov/rl/>), surveyed Alaskan waters between Glacier Bay National Park and Prince William Sound. Visual observations and small boat efforts have documented*



**Group of killer whales encountered near the Alaskan coast.**

humpback and fin whales, harbor and Dall's porpoise and killer whales. This

week the *LASKER* will continue southwest, surveying areas along the Kenai Peninsula and Kodiak Island. Please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**NOAA Ship *Reuben Lasker* working off Alaska.**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June - August - The main goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Our field work also includes nest protection activities that are coordinated with Sandy Point National Wildlife Refuge staff to enhance conservation goals as well independent projects carried out by interns, students and volunteers that are part of the field team headed up by Kelly Stewart. Sargassum continues to be a problem for the nesting beach this past week as low pressure systems to the southeast of the island pushed huge rafts of the seaweed toward shore. Hatchlings take longer to climb over the seaweed and get entangled more easily. Nest hatching is peaking for the season. After six weeks of sampling, the team has observed 125 nests and sampled 3,341 hatchlings. Amy Frey and Peter Dutton joined the team this week along with long-time volunteer Amy Semple, and Emma Dutton, and Micaela McDonald. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).*

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, central tropical Pacific, 2 July - 2 August - This past week the Yushin-Maru no.3 has been in consistent trade winds ranging from 14-20 kts. The week's total searching distance was 694.9 n. miles. Survey area included waters of the US EEZ from north of Laysan Island to the east (past Nihoa reef) then south and southwest past French Frigate Shoals. Water temperatures ranged between 26°-28.5°C. Air temperature ranged between 25°-30°C. Jim Gilpatrick (US Observer) continues to record sightings and collect ancillary data.*

*Week of 20 July 2015*

*Collaborative SWFSC/AFSC Large Whale Survey, West Coasts of US & Canada, 9 July – 9 November* – From 12-19 July, the Collaborative Large Whale Survey 2015 (CLAWS), a joint field effort by Southwest Fisheries Science Center and Alaska Fisheries Science Center onboard the NOAA ship *RUBEN LASKER* (<http://www.moc.noaa.gov/rl/>), surveyed waters between Newport, Oregon and Cross Sound, Alaska. Visual observations and small boat efforts documented humpback whales, Dall’s porpoise and killer whales. The observation of



Small boat operations, Sitka Sound, Alaska. L to R: Yin, Martínez and Lang.



“Pelagic transients” observed on 12 July.

killer whales on 12 July was of particular interest. This

group of whales was approximately 170 nmi offshore off Newport, OR, feeding on an unidentified pinniped species. Images of these “pelagic transients” have killer whale researchers puzzled, as they do not recognize them from existing west coast photo-identification catalogs. This week the *LASKER* will continue north, surveying areas along the outer Pacific coast of Glacier Bay National Park and Prince William Sound. Please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [annette.henry@noaa.gov](mailto:annette.henry@noaa.gov) for details.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June - August* - The main goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Our field work also includes nest protection activities that are coordinated with Sandy Point National Wildlife Refuge staff to enhance conservation goals, and independent projects carried out by interns, students and volunteers that are part of the field team headed up by Kelly Stewart. Among these is UCSD Senior Shreya Banerjee, who is collecting data for her senior thesis entitled “Paternal contribution to hatchling size in leatherback turtles.” She will work in the Marine Turtle Genetics Program to complete this project during the fall and winter quarters.



Two hatchlings from the same nest vary greatly in size.

*Project Summary:* Leatherback sea turtle (*Dermochelys coriacea*) hatchling size varies both among and within clutches (Wallace et al. 2007). It has been shown that hatchling mass is positively correlated with egg mass but with a 2 g increase in hatchling mass is a 10 g increase in egg mass (Wallace et al. 2006). Leatherbacks also been shown to demonstrate polyandry and polygyny (Crim et al. 2002; Stewart and Dutton 2011). Using microsatellite markers to genotype hatchlings and their known mothers, along with deductive genotype reconstruction, multiple paternity may be detected within a clutch (Stewart and Dutton 2011). In this study, we will determine whether hatchling size is related to differential paternity within a clutch. Using genetic samples collected from nesting females and the first 24 hatchlings that emerge from each at SPNWR we will be able to assess the observation of both small large hatchlings from a single clutch. To do this, we take genetic samples and record the weight and morphometric measurements each hatchling. Once back at the SWFSC lab, we will use microsatellite markers to determine which nests have multiple paternity and assign individual hatchlings to a father. This study will help determine whether genetic or environmental factors determine hatchling size upon emergence.

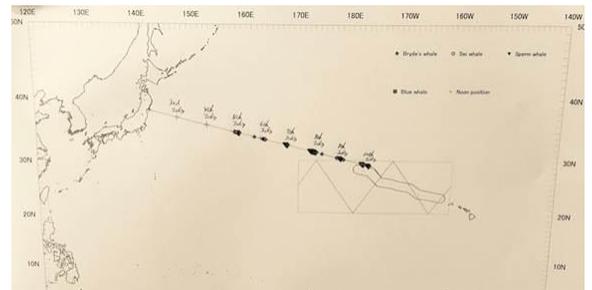


**Shreya Banerjee (UCSD senior) weighs hatchlings from a clutch.**

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Since the beginning of sampling five weeks ago, the team has protected 104 nests. See weekly report from 6 July for more detail on project objectives. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, central tropical Pacific, 2 July - 2 August* - The R/V Yushin-Maruo No.3 has transited across the North Pacific Ocean and is working near the Hawaiian Islands. For the week of 12-18 July, 616.7 nmi were surveyed, two Bryde's whales were biopsied and the ocean water temperatures (27.5 °C) are similar to air (25-30 °C). For additional information, contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov).



**Trackline of Yushin-Maruo No.3 from Japan to the survey area.**

Summary of sightings.

Species	Primary		Secondary		Total	
	Sch.	Ind.	Sch.	Ind.	Sch.	Ind.
Bryde's whale	3	3	0	0	3	3
Sperm whale	2	17	0	0	2	17
<i>Mesoplodon</i> spp.	1	2	0	0	1	2
Southern form short finned pilot whale	1	32	0	0	1	32
Spotted dolphin	1	46	0	0	1	46
Striped dolphin	3	199	0	0	3	199
Unidentified dolphin	2	30	0	0	2	30

Summary of photo-ID data

Species Photographed	Total Sightings		Photographs				
	Sch.	Ind.	Sch.	Ind.	Ind.	Useful photo-ID images*	Ind. photo-id'd**
Bryde's whale	3	3	3	3	3	44	1
<i>Mesoplodon</i> spp.	1	2	1	2	2	14	NA
Southern form short finned pilot whale	1	32	1	32	NA	27	NA
Striped dolphin	3	199	3	199	NA	NA	NA
<b>Total</b>	<b>8</b>	<b>236</b>	<b>8</b>	<b>236</b>	<b>5</b>	<b>85</b>	<b>1</b>

\* Images useful for photo-ID may not be sufficient to catalogue the individual, but show useful identification characteristics such as dorsal fin shape, nick in dorsal, scars etc. These images are coded Green in the IWC Lightroom database.

\*\* Photo-ID images are sufficient to catalogue the individual. These images are coded with the keyword "Photo-identification" in the IWC Lightroom database.



Figure 1 At top: Bryde's whale near the bow of the Yushin-Maru no. 3; NW Hawaiian Islands, left: lightly spotted and relatively large spotted dolphins in the Kuroshio Current; right: Pantropical spotted dolphins NW of the Hawaiian Island chain.

*Last week saw the successful completion of the first field effort in a new collaboration on large whale health and condition - MMTD* Scientists John Durban and Holly Fearnbach (Image 1) are partnering with Michael Moore from Woods Hole Oceanographic Institution to use a small unmanned hexacopter to obtain high quality vertical images of humpback and right whales for photogrammetric measurement of body condition, and to collect blow samples for studies of respiratory microbiology. In combination, these approaches will be used to develop non-invasive health indices for large whales. This first field effort focussed on humpback whales in the waters off Cape Cod, Massachusetts. The hexacopter was successfully flown 59 times from a 55' sailing sloop, collecting high-quality photogrammetry images (Image 2) from 36 different humpback whales and 19 blow samples from these same individuals (Image 3). This is the first time that photogrammetry has been coupled with blow collection for any cetacean, and it was a resounding success. Comparative field studies of humpback whales will continue in Antarctica in January, and studies of north Atlantic right whales are planned for spring 2016. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Holly.Fearnbach@noaa.gov](mailto:Holly.Fearnbach@noaa.gov)



MMTD flight team John Durban (left) and Holly Fearnbach (right) joined Michael and Hannah Moore to fly hexacopter missions from the deck of the 55' sailing sloop, Rosita. Photogrammetry images and blow samples were successfully collected during 59 flights.

photogrammetry images (Image 2) from 36 different humpback whales and 19 blow samples from these same individuals (Image 3). This is the first time that photogrammetry has been coupled with blow collection for any cetacean, and it was a resounding success. Comparative field studies of humpback whales will continue in Antarctica in January, and studies of north Atlantic right whales are planned for spring 2016. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Holly.Fearnbach@noaa.gov](mailto:Holly.Fearnbach@noaa.gov)



Overhead images of humpback whales will be combined with altitude logs to estimate length, and body condition will be inferred from shape profiles.



For the first time a small hexacopter was used to successfully collect blow samples from humpback whales for studies of respiratory microbiology.

*Week of 13 July 2015*

*Collaborative SWFSC/AFSC Large Whale Survey, west coasts of US & Canada, 9 July – 9 November* - The Collaborative Large Whale Survey 2015 (CLAWS), a joint field effort by Southwest Fisheries Science Center and Alaska Fisheries Science Center, began 9 July in San Diego. This survey is the first scientific project conducted onboard the NOAA ship RUBEN LASKER (<http://www.moc.noaa.gov/rl/>). The scientific team on Leg 1 includes: Aimée Lang (SWFSC), Suzanne Yin (SWFSC), Heather Colley (SWFSC), Sergio Martínez (Universidad Autónoma de Baja California), Cené Bryant (Humboldt State University), Jan Straley (University of Alaska Southeast) and Dave Weller (Chief Scientist, SWFSC). The ship is presently approaching the California/Oregon border and to date has encountered blue and fin whales, killer whales, pilot whales, Risso's dolphins, common dolphins and Dall's porpoise. See weekly report from 6 July for project objectives. Please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for details.



**Leg 1 Scientific Party. Left to Right: Martinez, Colley, Yin, Weller, Lang and Bryant on bow of NOAA Ship Reuben Lasker.**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June - August* - The main goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Our field work also includes nest protection activities that are coordinated with Sandy Point National Wildlife Refuge staff to enhance conservation goals as well independent projects carried out by interns, students and volunteers that are part of the field team headed up by Kelly Stewart. Among these is STAR Fellow Christina MacMillan, working on an independent study entitled "The potential impact of beach debris and Sargassum fluitans on leatherback hatchlings at Sandy Point National Wildlife Refuge."



**STAR Fellow Christina MacMillan sorts the trash collected during the weekly beach survey.**

*Project Summary: The impact of anthropogenic debris on hatchlings has been researched at various other nesting beaches but has not been looked at specifically at Sandy Point. In addition, since 2011, huge masses of sargassum seaweed have been reported throughout the Caribbean and have impacted turtle nesting on many islands. The University of Southern Mississippi has a website dedicated to reporting its occurrence in the Caribbean (<http://www.usm.edu/gcrl/sargassum/>). To study the potential impact that beach debris and sargassum has on leatherback hatchlings at SPNWR, a beach clean up and trash survey is conducted and the amount of sargassum is documented every Monday morning (29 June to 3 August) on the southern side of Sandy Point. The southern side was chosen to conduct the survey due to hatchlings being released from this location and the abundance of trash and sargassum on the shore. Each survey is conducted along a 400-m long transect and all trash is collected from both new and decaying sargassum piles. The larger and heavier pieces of trash are moved aside and documented. All trash is later categorized according to NOAA's Marine Debris manual and some items are recycled. During the survey the width of the sargassum along the transect is measured at the beginning, mid, and final points. This study will document the rate of trash and sargassum washing ashore and provide information on some of the obstacles hatchlings may have to navigate on their path to the sea.*

The hatchling project is in its fourth week of sampling. A total of 83 nests have been sampled. See weekly report from 6 July for more detail on project objectives. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

*Collaborative project to develop non-invasive health indices for large whales, Cape Cod, MA, week of 13 July -* This collaborative research, undertaken by Woods Hole Oceanographic Institution (WHOI) and MMTD/SWFSC, will use a small, unmanned hexacopter to obtain high quality vertical images of humpback whales for photogrammetric measurement of body condition, and blow samples for studies of respiratory microbiology. In combination, these approaches will be used to develop non-invasive health indices for large whales. The MMTD flight team of John Durban and Holly Fearnbach will work with Michael Moore from WHOI on the 55' sailing sloop, *Rosita* 11-19 July. For further information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).

*International Whaling Commission Pacific Ocean Whale and Ecosystems Research (POWER) Survey, central tropical Pacific, 2 July - 2 August -* As of 11 July, POWER has surveyed 780 nmi, encountered Bryde's, sperm, pygmy, southern form of short-finned pilot whales, Cuvier's beaked whale, and Risso's, spinner, and spotted dolphins, and obtained 5 Bryde's whale biopsies. See weekly report of 6 July for project objectives. Contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov) for more information.

### *Week of 6 July 2015*

*Collaborative SWFSC/AFSC Large Whale Survey, west coasts of US & Canada, 9 July – 9 November -* The first project to be conducted on the NOAA Ship *Reuben Lasker* will be a collaborative research survey between the Southwest and Alaska Fisheries Science Centers. This 4-month survey will focus on assessment of large whale species along the U.S. and Canadian west coast between northern California and Kodiak, Alaska. Major components include: (1) the first range-wide assessment of gray whales that spend their summer south of the Aleutian Islands, (2) a dedicated visual line-transect and acoustics survey for right whales, and (3) sampling (photographic and biopsy) of blue and fin whales. The scientific team on Leg 1 includes: Aimée Lang (SWFSC), Paul Fiedler (SWFSC), Suzanne Yin (SWFSC), Heather Colley (SWFSC), Sergio Martínez (Universidad Autónoma de Baja California), Cené Bryant (Humboldt State University), Jan Straley (University of Alaska Southeast) and Dave Weller (Chief Scientist, SWFSC). Please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov) for more information.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, mid-June – late August -* The main goal of this project, now in its 7<sup>th</sup> year, is to genetically tag leatherback turtle hatchlings in order to



learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Started in 2009, this joint project with USFWS was initiated to sample and genotype hatchlings at Sandy Point National Wildlife Refuge (SPNWR), St.



Croix, U.S. Virgin

Islands. Hatchling genetic “fingerprints” can be compared to those of new nesting females each year. Eventually, we hope to genetically match a hatchling that left the nesting beach in a known year with a first-time nester. This information would give us direct evidence of the age to maturity for leatherbacks nesting in St. Croix. This 2015 nesting season is of particular interest since it has been 6 years since the first hatchlings were sampled, and we

will have the first opportunity to test the hypothesis put forward by some studies that leatherbacks mature within 5-6 years. Our field work also includes nest protection activities that are coordinated with SPNWR staff to enhance conservation goals. To date, 58 nests have been sampled this season. Of note, large amounts of pelagic sargassum (*Sargassum fluitans*) are being seen close to shore and accumulating on some areas of the beach (see photo). This phenomenon has been occurring throughout the Caribbean since 2011. STAR Fellow Christina MacMillan will be documenting the pelagic sargassum presence around Sandy Point National Wildlife Refuge as part of an independent research project. A second independent project is being conducted by Duke graduate and Program Assistant Claire Gonzales “The timing and tendencies of leatherback hatchling emergence at Sandy Point National Wildlife Refuge.” For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov). Photos: *Sargassum piles up on the beach; a hatchling with 4 rear flippers!; hatchling tracks in the sand.*

*International Whaling Commission POWER Survey, central tropical Pacific, 2 July – 2 August* - Jim Gilpatrick is the official US scientist aboard the R/V *Yushin-Maru No. 3* for this sixth consecutive survey of large whales under the international IWC-POWER program. The ship sailed from Shioyama, Japan and will cover waters from 170°E to 160°W between 30°N and 40°N, including portions of the U. S. EEZ and near the Marine National Monument “Papahānaumokuākea.” The cruise has five main objectives: (a) provide information for the proposed future in-depth assessment of sei whales in terms of both abundance and stock structure; (b) provide information relevant to Implementation Reviews of whales in terms of both abundance and stock structure; (c) provide baseline information on distribution and abundance for a poorly known area for several large whale species/populations, including those that were known to have been depleted in the past, but whose status is unclear; (d) provide biopsy samples and photo-identification photos to contribute to discussions of stock structure for several large whale species/populations, including those that were known to have been depleted in the past but whose status is unclear; (e) provide essential information for the intercessional workshop to plan for a medium-long term international program in the North Pacific. Contact [Robert.Brownell@noaa.gov](mailto:Robert.Brownell@noaa.gov) for more information.

*Green sea turtle ecological research, San Diego Bay, 7 July 2015* - The SWFSC turtle team will conduct field captures for their third day this season. So far, the team has captured six turtles since June. Contact [Robin.LeRoux@noaa.gov](mailto:Robin.LeRoux@noaa.gov) or [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.

*Aerial Photographic Survey of California Sea Lions, Channel Islands, 6-15 July* - Mark Lowry and Stephanie Nehasil will conduct this survey designed to assess abundance. The National Park Service (US Department of Interior) will provide a chartered aircraft. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for additional information.

*Week of 29 June 2015*

*Green Sea Turtle Ecological Fieldwork, San Diego Bay, CA* - Marine Turtle researchers from SWFSC conducted the first two field capture efforts of the season on 16 and 23 June 2015. During these outings, the team captured six green turtles. Four turtles weighed greater than 300 lbs, with the largest topping out at nearly 370 lbs! In addition, two of the six captured had never before been captured in San Diego Bay, including the largest turtle of the bunch. All turtles appeared very healthy. Skin and blood samples were taken to investigate trophic status, population genetics, and hormone levels. The Team was encouraged by the fact that even with all traces of the decommissioned South Bay Power Plant gone, the San Diego green turtles appear to still be using the sheltered cove adjacent to the power plant site as an evening resting area. See table below for sizes and weights of the six turtles. Contact [Jeffrey.Seminoff@noa.gov](mailto:Jeffrey.Seminoff@noa.gov) for additional details.



**Green turtle 144170 captured in San Diego Bay on 16 June 2015. This was the first capture of this turtle in San Diego Bay and the turtle was named 'Wiki' in honor of SWFSC Turtle Team's former scientist-turned-world-traveler Dan Proserpi.**

*Summary of green turtle captures in San Diego Bay by the SWFSC sea turtle research team, June 2015.*

Turtle	Straight carapace length (cm)	Curved carapace length (cm)	Straight carapace width (cm)	Curved carapace width (cm)	Weight (kg)
8370 "Nyah"	103.0	108.7	74.1	96.5	~160
33149 "Barry Manilow"	90.2	97.0	68.0	86.0	101.0
13585 "Olivia"	103.4	109.4	72.0	97.1	159.0
129974 "Crush"	79.2	85.0	60.4	78.0	65.0
144171 "Dr. J"	108.6	114.0	75.8	95.3	167.0
144170 "Wiki"	69.0	73.1	56.2	65.4	40.0

*Killer Whale Trophic Ecology, Aleutian Islands, Alaska* - The second week of fieldwork focused on investigating the foraging and diving behavior of killer whales to determine predation on and competition with Steller sea lions and other top predators in the region resulted in five tag deployments: 1 adult male sperm whale, 1 fish-eating "Resident," and 3 mammal-eating "Transients." The transient killer whales tagged are the target animals and makes the fieldwork a huge success. There have been eight encounters with killer whales in total, 4 with each type. This project aims to deploy depth-recording satellite transmitter tags to describe killer whale foraging behavior and movement, and is a collaboration between the University of Alaska (Russ Andrews), NOAA/AFSC (Paul Wade) and NOAA/SWFSC/MMTD (John Durban) with funding from the University of Alaska's Pollock Conservation Cooperative Research Center and the NOAA/AFSC Alaska Ecosystems Program. In addition, John Durban will assist AFSC scientists in flying an unmanned hexacopter to count Steller sea lions at haulouts and rookeries. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

*Steller Sea Lion Surveys, SE Alaska-Gulf of Alaska-Aleutian Islands (SWFSC in support of AFSC)* - Morgan Lynn is flying with a team of scientists from the AFSC's Marine Mammal Laboratory to conduct aerial photographic surveys of Steller lion rookeries and haulout sites. The team has almost completed all the sites in southeast Alaska and will begin surveying from Homer towards Dutch Harbor this week. Effort this focuses primarily on rookery sites in southeast Alaska, along the northern Gulf of Alaska, and within safe flying distance from Dutch Harbor. Another team plans to sample the most logistically challenging sites in the Western Aleutians using a hexacopter. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for additional information.



Morgan Lynn in his survival gear by the NOAA Twin Otter. Credit: NOAA

sea  
year  
sites

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), including age to maturity, breeding sex ratios and juvenile survival rates. Estimates for age to maturity in leatherback turtles (*Dermochelys coriacea*) have been particularly problematic, and range from 5-30 years in the published literature. Population recovery goals are based on how long turtles take to reach maturity, making this factor among the most fundamental for conservation. Despite this, there have been no direct empirical observations of age to maturity in leatherback turtles. Compounding the difficulty in establishing this important parameter, this trans-boundary species is difficult to track through their life history, although it is assumed that they spend early years in warm tropical waters and then become more wide-ranging as they mature, being better able to withstand cold water where their prey is located. Genetic fingerprinting offers the opportunity to mark an individual once, and forever be able to identify that individual should it be re-encountered (and sampled).



Figure 1 UCSD Senior Shreya Banerjee watches over an emerging leatherback nest.

The nesting population on St. Croix is an important US Index Population for leatherbacks that has been intensively monitored using a variety of Capture-Mark-Recapture methods with flipper tags, photo-identification and Passive Integrated Transponders (PIT) since 1981 (Dutton et al. 2005). Due to the richness and consistency of the demographic data, this population offers unique opportunities for research and development of tools and approaches for getting at vital rate parameters that are needed to improve stock assessments in sea turtles. In 2009 we began a project jointly with USFWS to sample and genotype hatchlings at Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands. Hatchling genetic “fingerprints” can be compared to those of new nesting females each year. Eventually, we hope to match a turtle that left the nesting beach in a known year with a first-time nester. This information would give us direct evidence of the age to maturity, at least for a leatherback on that beach. This 2015 nesting season is of particular interest

since it has been 6 years since the first hatchlings were sampled, and we will have the first opportunity to test the hypothesis put forward by some studies that leatherbacks mature within 5-6 years. Nests are beginning to hatch for this season and Kelly Stewart has initiated field operations at Sandy Point National Wildlife Refuge. Due to the dryness of the season and little food available, mongooses have been predated the leatherback nests more

often than usual after nest emergence, posing a new obstacle for nest management. The presence of our research team on the beach before sunset and through the night provides additional conservation value by monitoring and protecting emerging hatchlings that would otherwise be eaten by predators. STAR Research Teacher Christina MacMillan and UCSD Senior Shreya Banerjee have begun planning their independent projects, which they will work on over the course of the season. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

### *Week of 22 June 2015*



Program Assistant Claire Gonzales highlights a track from a nesting female leatherback. The inset shows newly emerged hatchlings.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands* - The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). Kelly Stewart initiated field operations on 13th June with help from local volunteer Donna Boles, Program Assistant Claire Gonzales, and summer intern Shreya Banerjee (UCSD Senior) and nests are beginning to hatch for this season. This year, about 320 nests have been laid on Sandy Point. The island is in a severe drought and the dry conditions may affect hatching success. Suzanne Roden and STAR Research Teacher Christina MacMillan will join the team this weekend. For more information, contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)

### *Week of 15 June 2015*

*Leatherback Turtle Genetic Tagging & Demography Research, St. Croix, US Virgin Islands (USVI)* – This week marks the beginning of the 2015 season – the sixth consecutive year of this project. The goal is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general), especially age at first reproduction. Kelly Stewart arrived in the USVI on 12 June to lead the research effort. Over the next 8 weeks, staff from SWFSC will spend time in the field, helped by a good volunteer contingent, as has been the case for previous years. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)

*Refugio Beach Oil Spill, Santa Barbara County* - MMTD personnel continue to participate in stranding response and marine mammal assessment activities related to the May spill. Nicky Beaulieu, Kerri Danil, Holly Fearnbach, Brittany Hancock-Hanser, and Keiko Iida assisted staff at Sea World California with necropsies of marine mammals, and Nick Kellar, Alexa Kownacki, and Michael Smith completed the six day boat-based survey for coastal bottlenose dolphins on Sunday, 7 June. The survey provided photographic documentation of individual bottlenose dolphins and other cetaceans in the study area, which are the coastal waters from Santa Barbara harbor to Gaviota. Activities associated with post-spill wildlife response are winding down and will now transition to focus on assessment activities. For additional information, contact [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov).

*Killer whale trophic ecology, Aleutian Islands, Alaska* - The second year of fieldwork focused on investigating the foraging and diving behavior of killer whales to determine predation on and competition with Steller sea lions begins this week. This is a collaboration between the University of Alaska (Russ Andrews), NOAA/AFSC (Paul Wade) and NOAA/SWFSC/MMTD (John Durban) with funding from the University of Alaska's Pollock

Conservation Cooperative Research Center and the NOAA/AFSC Alaska Ecosystems Program. From 18 June - 3 July, John Durban and Paul Wade will be hosted on a NOAA/AFSC Steller sea lion research cruise aboard on the U.S. Fish and Wildlife Service vessel, Tiġlax, starting at Adak Island, surveying to the western end of the Aleutian Islands and ending in Dutch Harbor. This project aims to deploy depth-recording satellite transmitter tags to describe killer whale foraging behavior and movement. In addition, John Durban will assist AFSC scientists in flying an unmanned hexacopter to count Steller sea lions at haulouts and rookeries. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

#### *Week of 8 June 2015*

*Update: Refugio State Park Oil Spill, Santa Barbara County* - MMTD personnel continued to participate in stranding response and marine mammal assessment activities related to the oil spill this week. Nicky Beaulieu, Kerri Danil, Holly Fearnbach, Brittany Hancock-Hanser, and Gabriela Serra-Valente assisted staff at Sea World California with necropsies of marine mammals that stranded in the spill area. Greg Campbell, Nick Kellar, Alexa Kownacki, and Michael Smith conducted boat-based surveys along the Santa Barbara County shoreline. The primary focus of the surveys is to photographically identify coastal bottlenose dolphins transiting and feeding in the spill area to estimate the proportion of the population present. This is one aspect of the assessment activities being conducted by NOAA's National Resource Damage Assessment (NRDA) group. Contact [Susan.Chivers@noaa.gov](mailto:Susan.Chivers@noaa.gov) for more information.

#### *Week of 1 June 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* – Last week was the tenth and final week of the 2015 calf production survey. The visual survey team at Piedras Blancas Lighthouse recorded 7 cow/calf pairs, down from 58 the previous week. Farther north at Granite Canyon, the thermal sensor system set in place late December of 2014 to record the blows of passing gray whales, also completed its final day of data collection for the 2014/2015 season. This year marks the first time thermal sensors, able to detect blows to 5 km offshore in good weather, have been used for 24 hr/day through both the north- and southbound migration. These data will contribute to estimates of population abundance and calf production for the 2014/15 season. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



Standing watch at Piedras Blancas lighthouse.

*Week of 25 May 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - Week 9 of the northbound gray whale calf survey experienced a late surge with 58 calves recorded in good sighting conditions. The season total is now 403 with one survey week remaining, making this among the five most abundant calf production estimates in our 22-year time series. Last week's Santa Barbara oil spill has prompted the field team to record additional behavioral observations and photographs of these migrating animals. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



**Morgan Lynn photographs gray whales for photo-identification purposes.**

*Week of 18 May 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - The migration peak has passed and the rate of gray whale cows with calves traveling north is slowing. Week 8 of the shore-based survey of northbound gray whale cows and calves logged 69 calves, bringing the season total to 345. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Week of 11 May 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - Week 7 (last week) of the shore-based survey of northbound gray whale cows and calves logged 127 calves, the highest weekly count to date for this season. Weather was generally quite good; 75 minutes of effort was lost due to a small front passing along the Central California Coast. This week's count brings the season total to 276 calves which puts this count in line with counts from 2012 and 2013, each resulting in total estimates of northbound calves of around 1100 (about 5.5-6% of the estimated size of this population).



**Susan Chivers records count data while Jeremy Rusin prepares to photograph a passing cow/calf pair. The shore-based images will be used to determine whether we can link the vertical images from the hexacopter with the oblique images that make up the majority of the ID catalogues for this population.**

Last week marked the end of our efforts to deploy a small UAS (APH-22 hexacopter from Aerial Imaging Solutions) from shore to collect vertical photographs from which we can estimate condition (or fatness) of northbound cows and calves based on their size and shape (see photos at left). This effort resulted in vertical aerial images of 66 cow/calf pairs from 102 aerial flights of the small hexacopter. Sampling altitudes ranged from 100 to 135 ' and we saw no sign that the whales were aware of the presence of the small aircraft hovering overhead.

Previously, we attempted to monitor the condition of northbound whales from manned platforms and the whales were so difficult to sample that we averaged only 17 cows photographed successfully each season. Although a small UAS will not be the ideal tool for every aerial photographic research application, in this case, they produced more images of higher quality, at much less cost, with no risk to the scientific party and with no disturbance to the animals sampled.

Details of this survey, the time series, and this year's calf counts can be found at [Survey of Northward Migrating Gray Whales](#). Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



**Aerial photographs of adult female gray whales with calves taken using a small unmanned hexacopter at an altitude of ~135ft overhead. On left, an emaciated female in poor condition; right shows a robust female and calf.**

*Week of 5 May 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - This past week was a busy one at Piedras Blancas: counting whales, flying hexacopter missions, and hosting visitors. We had visitors from local and international media, the National Marine Sanctuary Program, and Donna Wieting (Director Office of Protected Resources (OPR), NOAA Fisheries) and Nicole LeBoeuf (Chief Marine Mammal and Sea Turtle Division, OPR, NOAA Fisheries). Survey effort resulted in 62 calves recorded during 42 hours of watch effort. Generally the weather was very good, in spite of losing a full day to fog and wind.

During the second week of the Unmanned Aerial Survey (UAS) project, the flight team completed 28 flights with the APH-22 hexacopter and recorded some spectacular images of northbound gray whale cows and calves. This UAS work has already produced images from which we can measure size and shape for about 35 whales. In previous years, sampling of these animals with manned platforms resulted in an average of 10-15 images that could be measured; already the UAS project is highly successful.

Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Research Cruise to Characterize the Monterey Bay National Marine Sanctuary, Including the Davidson Seamount: Marine Mammals, Seabirds, and Midwater Fishes, May 5-13, 2015* - Scott Benson is participating in the first leg (9 days) of the survey as a marine mammal observer aboard the NOAA Ship *Shimada*. The overall goal of the cruise is to compare marine life over Davidson Seamount versus adjacent to it and conduct midwater fish characterization in Sanctuary Ecologically

Significant Areas (SESAs). Marine mammal and seabird surveys will be conducted above and adjacent to the Davidson Seamount with 25X "big-eye" binoculars loaned to the effort by SWFSC-MMTD. Additional research will include Puma drone surveys to observe marine mammals, recording of marine mammal and ocean noise via hydrophone, oceanographic data collection and water sampling, collection of water samples for environmental DNA analysis, and filming for video production of NOAA research and collaborative Marine Biodiversity Observatory Network (MBON). A cruise blog will be maintained throughout the expedition: <http://sanctuariesimon.org/news/davidson2015>.



**Above: Gray whale cow with calf image taken from APH-22 hexacopter. Images are used to measure size and shape. Below: John Duban pilots the hexacopter home and Holly Fearbach catches it while Donna Wieting, Nicole LeBoeuf, and Susan Chivers observe the operations. Photo credits: NOAA.**



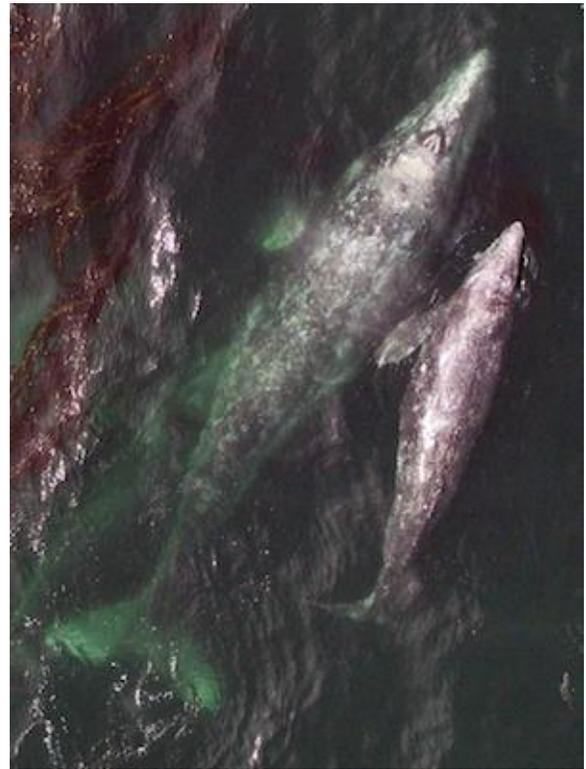
*Week of 27 April 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May -* Week 5 of the shore-based survey of northbound gray whale calves produced a count of 48 calves in just over 59 hrs of survey effort in very good to excellent sighting conditions. Sighting rates continue to increase.

Week 5 was our first of sampling with the APH-22 hexacopter. The goal of this effort is to monitor condition of cows and calves based on measurements of their size and shape from vertical aerial photographs. The Unmanned Aerial Survey (UAS) team (John Durban and Holly



**APH-22 hexacopter in flight at Piedras Blancas.**



**Gray whale cow with calf photographed by the UAS at Piedras Blancas. Photo credit: NOAA.**

Fearnbach) has completed 27 flights and logged 4+ hrs to date. During this time, they collected measurable images of 13 adult females and 14 calves. Heavy overcast had a negative impact on image quality but results so far are

very encouraging (see photo). The aircraft is performing flawlessly.

Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

This coming Thursday and Friday, we will host Donna Wieting (Director Office of Protected Resources (OPR), NOAA Fisheries) and Nicole LeBoeuf (Chief Marine Mammal and Sea Turtle Division, OPR, NOAA Fisheries) for an on-site visit.

*Week of 20 April 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May -* The fourth week of the survey showed an increase of calves relative to previous weeks: 20 cow/calf pairs were recorded, including a calf that breached for a photo. This coming week, the hexacopter will be flown at to evaluate gray whale condition. Details of this survey, the time series, and this year's calf counts



Gray whale calf breaching off Piedras Blancas. Hexacopter calibrated and ready to fly starting April 20th. Photo credits: NOAA.

can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Loggerhead sea turtle research, Southern California Bight, 13-15 April 2015* - A team lead by SWFSC scientists spent two days last week at sea in the Southern California Bight (SCB) studying loggerhead sea turtles after very recent CalCOFI reports of large numbers of this species in the area. The team also released a small juvenile loggerhead (photo) that had been at the Aquarium of the Pacific (Long Beach) rehabilitation facility after being recovered in the SCB on 16 March. Although only a single turtle was seen during survey efforts, the team looks forward to future survey efforts, coincident with warm water events. Contact PI [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.



Photo on left: Loggerhead research team with juvenile satellite-tagged loggerhead turtle aboard the *Outer Limits* near San Clemente Island. Team members: (top row, l-r) Alexander Gaos, Tomo Eguchi, Peter Dutton, Jeff Seminoff, Scott Benson, Ian Bell, Ralph Pace, Michael Jensen; (bottom row, l-r) Camryn Allen, Lisa Komoroske, Joel Schumacher. On right: Release of the first-ever satellite-tagged loggerhead turtle in the Southern California Bight. Researchers Jeff Seminoff and Tomo Eguchi in the background. To accommodate fast growth of this small juvenile turtle, a stretchable epoxy-neoprene tag attachment technique was used. Photo: Ralph Pace, NMFS Permit Number: 060213

### *Week of 13 April 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - The third week of the survey had some wind and rain that cut down effort and only three cow/calf pairs were seen. This is about normal for this time of the year and next week we expect to see the counts of calves start to increase. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



Nicole Beaulieu, Anita Gilles, and Kelly Schill-Jacovino on watch at Piedras Blancas.

### *Week of 6 April 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - The team completed the second week of the survey of northbound gray whale calves on Friday, April 3rd. The team recorded 10 northbound calves and also the first blue whale of the season. The second week was characterized by high winds that cost 14 hrs of effort. Still, counts of calves (14 for the season) are running a little higher than normal for this stage of the migration which is consistent with what has been reported from the lagoons and others counting northbound gray whales. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



Jim Gilpatrick and Alexa Kownacki (SWFSC Intern) on gray whale survey watch.

*Pinniped Ecological Studies, Channel Islands, Southern California Bight, Quarterly* - Mark Lowry and Mridula Srinivasan will travel to San Nicolas Island April 6-8 to collect California sea lion scat samples for diet analysis. On April 7 they will be joined at San Nicolas Island for the day by Jim Milbury, Public Affairs Officer for NOAA Fisheries West Coast Region, who will be escorting Louis Sahagan, a staff reporter for the Los Angeles Times newspaper, who is doing a story on Mark's 34 year sea lion diet study. Louis Sahagan will be accompanied by a photographer/videographer who will photograph Mark while collecting sea lion scat samples and while being interviewed. Mark Lowry and Marilyn Lowry will travel to San Clemente Island April 10-13 to collect California sea lion scat samples for diet analysis and to count pinnipeds. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

### *Week of 30 March 2015*

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, CA 23 March – late May* - The team completed the first week of the annual survey of northbound gray whale cows and calves from the Piedras Blancas Light Station last week, recording 4 calves in the 46 hours of survey effort; about 11 hours of effort was lost to fog and high winds. In addition to gray whales, there were sightings of killer and humpback whales from the watch station. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

### *Week of 23 March 2015*

*Green Turtle Ecological Research, San Gabriel River, 11 March 2015* - A juvenile green turtle was captured in the San Gabriel River as part of the SWFSC/WCRO monitoring program. The turtle weighed 43kg and measured 67.5 cm straight carapace length. Blood and tissue samples were collected to determine the sex, nesting beach origin, and health status. An acoustic tag was deployed in order to track the animal's movement throughout the River. For more information, contact PI's [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) or [Robin.LeRoux@noaa.gov](mailto:Robin.LeRoux@noaa.gov).

*Eastern North Pacific Gray Whale Calf Production Survey, Piedras Blancas, CA, 23 March – 29 May* On Monday, March 23<sup>rd</sup>, the shore-based survey of northbound gray whale cows with calves will begin at the Piedras Blancas Light Station. This will be the 22<sup>nd</sup> consecutive year of this effort and the first season in which we will incorporate the use of our APH-22 hexacopter to collect vertical images of the northbound whales to monitor size and condition of both cows and calves. These animals serve as sentinels for the steady changes taking place in the Arctic as this system warms, whales feed in progressively northward regions, and ice cover is reduced. See the

project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> for additional details and/or contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).

*SORP Antarctic Blue Whale Project* - March 12<sup>th</sup> marked the end of a 6-week multinational, multidisciplinary, collaborative Antarctic blue whale research voyage conducted under the auspices of the International Whaling Commission's Southern Ocean Research Partnership (SORP). New Zealand's R/V *Tangaroa* was the vessel used for the voyage with scientists from New Zealand, Australia, the United Kingdom and the United States. NOAA funded the participation of Paula Olson during the voyage.

More than 40,000 Antarctic blue whale calls were localized using sonobuoys to guide the *Tangaroa* to groups of Antarctic blue whales. The ship approached 21 groups of blue whales, photo-identifying 58 whales. The photo-id data will be used to estimate the population size and movements of Antarctic blue whales as part of SORP's long-term Antarctic Blue Whale Project. Krill swarms in the vicinity of blue whales were successfully mapped, characterized and monitored using echosounders. Blue whale distribution and krill mapping data, as well as associated oceanographic, ice and other remotely sensed data will be analyzed to determine the factors that influence blue whale distribution in Antarctic waters. For additional information, contact [Paula.Olson@noaa.gov](mailto:Paula.Olson@noaa.gov).



Blue whales seen on the SORP survey. Photo credit: Paula Olson

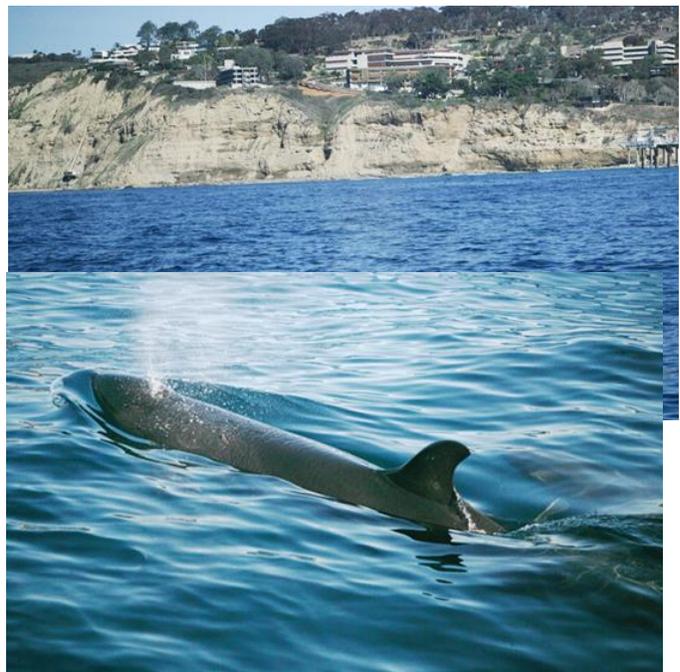
#### *Week of 15 March 2015*

*No report.*

#### *Week of 8 March 2015*

Local cetacean sampling - Surprise! Surprise! We had a group of out-of-town visitors unexpectedly drop in for an exceedingly rare stint in La Jolla this week. Approximately 30-40 false killer whales, initially spotted by Trevor Joyce and some folks at Scripps, were feeding near the edge of La Jolla canyon. Within an hour of hearing this news, John Hyde, Michelle Robbins, and Nick Kellar had launched the orange RHIB (DS Jr.) and we were in pursuit while Trevor was keeping an eye on the animals from the lab. When we hit the water the nearest animal was within 50-meters of the pier ... it was a short pursuit.

Most of the animals looked healthy but a few individuals were showing ribs, and there is some evidence from the photos of animals with lower levels of post-cranial fat (nascent "peanut heads"?). We found 2-4 small calves within the group, and one mother calf pair came by for a very close inspection



of the RHIB; they were within a meter of the vessel before ducking under it and emerging just on the other side. Michelle took some great photos of the encounter; hopefully Dave Weller can use those in an emerging blackfish photo ID project he's helping construct. In addition, we collected skin biopsies from five different animals, making Karen Martien particularly happy because she will add those to her genetic analysis of the species. We will also use these biopsies to assess the pregnancy state and overall health of the sampled individuals.

Contact [Nick.Kellar@noaa.gov](mailto:Nick.Kellar@noaa.gov) for additional information.

Photos at right: Top: false killer whale dorsal fin with SWFSC new offices in the background. Middle: false killer whale swimming; Bottom: sea lion complaining about loss of prey; Photo credit: Michelle Robbins.



*Green Sea Turtle Ecological Research, San Gabriel River, Wednesday, March 11th* - Tomo Eguchi, Robin LeRoux, and Camryn Allen will conduct green sea turtle field efforts in Orange County's San Gabriel River. The team will work with biologists from California State University - Long Beach and NMFS West Coast Regional Office to capture turtles and apply ultrasonic transmitters. The team will also deploy of a autonomous mobile tracking robot (courtesy of CSULB) that will monitor the fine-scale movements of green turtles in the river. For more information contact PI Tomo Ecughi ([Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov)) or Robin LeRoux ([Robin.LeRoux@noaa.gov](mailto:Robin.LeRoux@noaa.gov)).

*US-Chile Collaborative Blue Whale Project* – The collaborative efforts of Chilean scientists and scientists from Woods Hole Oceanographic Institute and SWFSC are entering their 3rd full week of effort from the Chilean research vessel *Centinela*. Vertical images of several blue whales have been collected during 30 successful missions flown with the APH-22 hexacopter. This week the team plans to attempt to collect breath samples from blue whales using a smaller water-tight quadcopter. Contact Wayne Perryman for details



*Week of 1 March 2015*

No report.

*Week of 23 February 2015*

No report.

*Week of 16 February 2015*

*Antarctic Killer Whale Research, Antarctic Peninsula*--This week fieldwork continued into the ecology of killer whales around the Antarctic Peninsula. John Durban and Bob Pitman are onboard the expedition ship National Geographic Explorer for the third research trip of the season, hosted by Lindblad Expeditions and National Geographic Society. Five groups of killer whales (2 x large-form type B, 3 x small-form type B) were sighted this past week, enabling the photo-identification of ~100 distinct whales and the deployment of two LIMPET satellite tags. The large B's were observed to catch and eat a seal (likely Weddell seal) and the small B's were seen catching penguins. One of the tags deployed is a depth-recording transmitter that will provide dive behavior data from large Bs to infer key foraging strategies and areas; this



Photos of spyhopping juveniles of both large (left) and small-form (right) Type B killer whales; note the large post-ocular eye patch characteristic of Type B's and also the more delicate muzzle of the fish-eating small form along with the difference in bulk between the whales.

is only the second depth tag deployed on this elusive type during six years of study. The second tag is a location-only transmitter, intended to provide longer tracking of a group of small Bs that has been tracked since December, when a different whale in this group was tagged; together we hope these tags will allow this group to be tracked throughout the austral summer, fall and into the winter. These direct observations and the remote monitoring of tags will be used to evaluate the trophic impacts of killer whales as top predators within this rapidly-changing system. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Robert.Pitman@noaa.gov](mailto:Robert.Pitman@noaa.gov) for additional information and/or visit the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=210&id=9606>

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29 December - 14 February*--Last week marked the end of the 2014/2015 field season to estimate abundance of eastern North Pacific gray whales. Field team members were Dave Weller, Wayne Perryman and Paul Fiedler. Mridula Srinivasan, from the NMFS Office of Science and Technology, visited the field site 10-11 February to learn about the survey and gain experience with data collection. Daily counts of southbound whales last week declined substantially, as was expected for this point in the season, while counts of northbound whales increased. The thermal cameras on site will continue to record data 24 hours a day until June at which time they will have documented the entire south- and north-bound migrations. On Monday 9 February two stories on the survey, including interviews with a number of MMTD scientists, were featured on NPR Monterey (<http://kazu.org/post/technology-expands-gray-whale-count>) and the NOAA Fisheries website ([http://www.fisheries.noaa.gov/stories/2015/02/gray\\_whale\\_survey\\_thermal\\_imaging.html](http://www.fisheries.noaa.gov/stories/2015/02/gray_whale_survey_thermal_imaging.html)). For additional details contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and see the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036>.



Dave Weller, Mridula Srinivasan and Paul Fiedler counting gray whales at the NOAA Granite Canyon Field Station.

### *Week of 9 February 2015*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29 December – 14 February* - This is the final week of visual observations for the 2014/2015 field season to estimate abundance of eastern North Pacific gray whales. Field team members are Dave Weller, Wayne Perryman and Paul Fiedler. Daily counts last week began to decline as is expected for this point in the season when the migration shifts from southbound to northbound. The thermal cameras on site will continue to record data 24/7 until June at which time they will have documented the entire south-north migration. On Monday, February 9th, NPR Monterey (90.3 KAZU) will air a story on the survey including interviews with a number of MMTD scientists. For additional details contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) and/or see the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036>.

### *Week of 2 February 2015*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29 December – 14 February* - This week is the sixth of the 2014/2015 field season to estimate abundance of eastern North Pacific gray whales. Field team members are Jeremy Rusin, Morgan Lynn and Paul Fiedler. Daily counts last week continued to be relatively high and the weather has been extremely cooperative. See the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036> for additional details and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).

### *Week of 26 January 2015*

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29 December – 14 February* - This week is the fifth of the 2014/2015 field season to estimate abundance of eastern North Pacific gray whales. Field team members are Susan Chivers, Jeremy Rusin, and Vicki Pease. The highest daily count for the season occurred last week on 22 January. See the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036> for additional details and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).

*Pinniped Ecological Research, Southern California Bight* - Quarterly pinniped field studies were conducted in the Southern California Bight last week. Mark Lowry and Joel Schumacher traveled during January 20-23 to San Nicolas Island to collect California sea lion scat samples for diet analysis. Mark Lowry then traveled from January 23-26 with Stephanie Nehasil to San Clemente Island to collect California sea lion scat samples for diet analysis and count pinnipeds. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

### *Week of 19 January 2015*

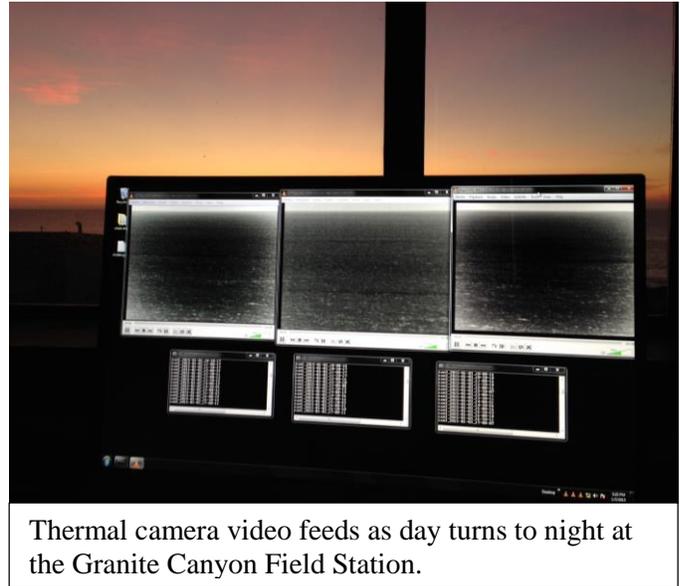
*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29*

*December – 14 February* - This week is the fourth of the 2014/2015 field season to estimate abundance of eastern North Pacific gray whales. Field team members are Susan Chivers, Aimee Lang and Vicki Pease. The weather conditions during the first three weeks of the survey have been excellent, allowing for nearly uninterrupted visual observations and thermal camera recording. The survey was recently featured in the Monterey Herald

<http://www.montereyherald.com/environment-and-nature/20150117/a-winters-watch-scientists-track-whale-migration-from-big-sur-bluffs> and NPR

Monterey has interviewed MMTD scientists and visited the research site several times in preparation for a radio story early next month. See the project website

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036> for additional details and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).



Thermal camera video feeds as day turns to night at the Granite Canyon Field Station.

*C-POD Mooring Retrievals in Monterey Bay* - Karin Forney and SIO graduate student Eiren Jacobson successfully retrieved six harbor porpoise click detector (C-POD) moorings from Monterey Bay this week. Highly trained scientific divers from Moss Landing Marine Laboratories (MLML) conducted mid-water searches and attached retrieval lines so that moorings could be hauled on board the R/V Sheila B. Five of the six moorings had acoustic releases that failed when triggered in December 2014 due to a swivel shackle that caught in the release mechanism. Divers located four of these moorings; one additional mooring, unintentionally entangled in fishing gear, was returned by a local fisherman. One



Left photo: Karin Forney, diver Selena McMillan, and Captain John Douglas examine the problematic swivel shackle attachment point and formulate a recovery plan. Right photo: MLML divers Diana Steller and Clint Collins prepare to search for a C-POD mooring.

instrument is still at large: divers were able to locate the mooring anchor but the line, C-POD, and floats have disappeared. We are optimistic that this gear will eventually make its way back to us. In the meantime, the team



has retrieved ten of the eleven C-PODs deployed in August 2014 and we look forward to analyzing approximately 1,350 days of harbor porpoise click data. For additional information contact [Karin.Forney@noaa.gov](mailto:Karin.Forney@noaa.gov).

### Week of 12 January 2015

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29 December – 14 February* - This week is the third of the 2014/2015 field season to estimate abundance of eastern North

Pacific gray whales. Field team members are Chivers, Aimee Lang and Dave Weller. The weather conditions during the first two weeks of survey were excellent (in fact, week 2 saw no above a Beaufort 2!), allowing for nearly continuous visual observations and thermal camera recording. Seth Sykora-Bodie, a Knauss Fellow working in the Office of Protected Resources, will join the research this week to gain field experience. Regina Guazzo, a Ph.D. student at SIO, will also visit week. Regina's dissertation includes research on gray whale vocal behavior and she will work with Dave Weller to integrate acoustic data presently being collected by three autonomous acoustic moored sensors off Granite Canyon with the MMTD visual and thermal camera data.



Lisa Ballance and Dave Weller on watch for gray whales at the Granite Canyon Field Station.

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See the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036> for additional details and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).

### Week of 5 January 2015

*Eastern North Pacific Gray Whale Abundance Survey, Granite Canyon Field Station, Carmel, CA, 29 December – 14 February* - This week is the second of the 2014/2015 field season to estimate abundance of eastern north

Pacific gray whales. Field team members are Wayne Perryman, Dave Weller, and Lisa Ballance. Ravi Shiwamangal visited the site over the weekend to check on and improve data collection, backup, and storage for the thermal sensor systems, and to bring internet connectivity at the field site into the 21st century. Despite the fact that his official affiliation with SWFSC is with IT, we hope to steal more of his time in the future. See the project website <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036> for additional details and/or contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov) or [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov).

### Week of 22 December 2014

*Antarctic Killer Whale Research, Antarctic Peninsula* - Last week John Durban and Holly Fearnbach concluded the second expedition of the 2014 Antarctic season onboard the *National Geographic Explorer*, continuing investigations into the ecology of killer whales around the Antarctic Peninsula. Three groups of killer whales were sighted this trip, including all three types of killer whales that can be found around the Antarctic Peninsula: Types A, B (large form) and B (small form). John and Holly collected photo-identifications from all groups for mark-recapture estimates of abundance and collected photogrammetry measurements from ~40 individual whales to facilitate taxonomic differentiation. A small satellite LIMPET tag was deployed on a Type B (small form) whale (4 tags for the season), which will enable remote monitoring of ranging patterns and also facilitate follow-up studies of predation behavior during later expeditions. Hunting events observed already this season have added to growing evidence of prey specialization: Type A whales were observed eating a young minke whale, B (large form) whales were followed when hunting elephant seals and B (small form) whales chased and consumed brush-tailed penguins (see photo). The team is now leaving Antarctica and will return in February; killer whale research

now shifts to McMurdo Sound on the other side of Antarctica, where Bob Pitman is now continuing studies of Type C (fish-eating) killer whales. *Photo - A group of Type B (small form) killer whales chasing (and later catching) a gentoo penguin.*

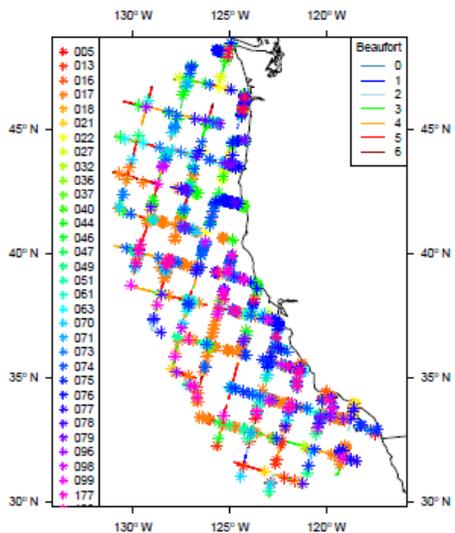


#### *Week of 15 December 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 -*  
The 2014 California Current Cetacean and Ecosystem Assessment Survey came to a successful close last Wednesday with the arrival of the OCEAN STARR into San Diego (see press links below). The entire survey grid was completed and preliminary data analysis is already underway. Highlights of the survey included unprecedented numbers of Sei whales, a new species record for California waters (pygmy killer whale), and large aggregations of loggerhead turtles. With the end of the survey comes our sincere appreciation and acknowledgments to a wide variety of institutions and individuals. The CalCurCEAS project is funded by the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service, the Department of Navy’s Pacific Naval Facilities Engineering Command, and the U.S. Department of the Interior, Bureau of Ocean Energy Management, Pacific Region (through Interagency Agreement M14PG00017 with the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center). We appreciate the efforts of Sean Hanser and Anne Bull in securing the Navy and BOEM funding that made this project possible. Shoreside support in preparation for this cruise was provided by Annette Henry, Shannon Rankin, Lisa Ballance, Jeremy Rusin, Libby Williamson, Jessica Redfern, Paul Fiedler, Robert Holland, Al Jackson, Lynn Evans, Gabriela Serra-Valente, Nicky Beaulieu, Nick Keller, Barb Taylor, Karen Martien, Wayne Perryman, Eric Archer, Jennifer Keating, Annette Stern, Terry Henry, Tony Cossio, Roger Hewitt, Jessica Lipsky, Cisco Werner, and all of our families. The crew of the *R/V Ocean Starr* have been extraordinarily helpful and delightful to sail with. Finally, to the sea-going scientists who were the “in the trenches” cornerstone of our success - You all are the best in the world. Our sincerest thanks and deepest respect. See the survey website for more information, including biweekly reports: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

#### *Week of 8 December 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 -*



Leg 5 (of 5) of this survey continues off the southern California coast. As of December 6th, the survey team aboard the *R/V Ocean Starr* has successfully completed all major transect lines for this survey (see figure) – a huge accomplishment! The ship is currently about 350 nmi offshore and will fill in a few remaining short transect gaps on the return transit, as well as continue opportunistic photo/biopsy/acoustic sampling on target species (including blue and fin whales, beaked whales, and killer whales). The last of several free-floating acoustic recorders (DASBRs) was also picked up successfully during the past week. The survey will end this coming Wednesday (Dec. 10), in San Diego after 120 days at sea. Vessel unloading will occur on arrival day with a post-cruise celebration that evening. De-briefing will occur the morning of Dec. 11 in the Pacific Room. See the survey website for more information, including biweekly reports:

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Ecology of Antarctic Peninsula Killer Whales, Antarctic Peninsula, November 2014 – March 2015* - This is the seventh consecutive year of this research, designed to collect empirical data to evaluate the trophic impacts of killer whales as top predators within this rapidly-changing system. John Durban and Holly Fearnbach (MMTD) are currently onboard the expedition ship *National Geographic Explorer*, hosted by Lindblad Expeditions and National Geographic Society. The ship conducts expeditions in the Antarctic Peninsula area, providing an



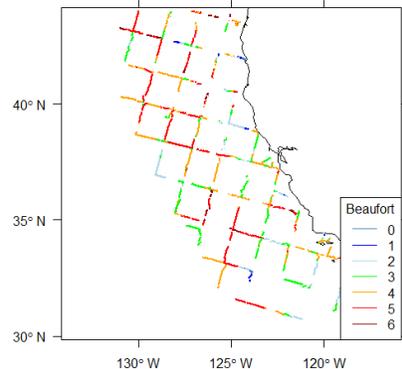
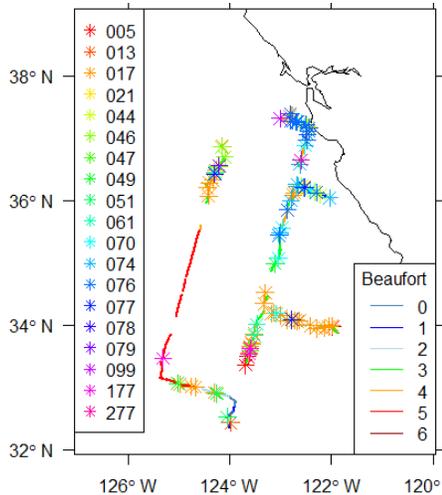
excellent opportunistic research platform. Three groups of killer whales (Types Ax2, Bx1) were sighted this past week, enabling the collection of photo-identifications, photogrammetry measurements, biopsy samples and the deployment of satellite tags. Small satellite LIMPET tags were deployed on three whales within two groups of Type A killer whales, which will enable remote monitoring of ranging patterns, diving behavior and migration, particularly in relation to their impact as specialist predators of Antarctic minke whales. One of these groups was observed to kill and consume an Antarctic minke whale calf, adding to our dataset on direct observations of predation.

Follow the movements of these tagged killer whales live at <https://swfsc.noaa.gov/MMTD-KillerWhale-TrackMap/>. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information. *Photo - John Durban and Holly Fearnbach deploy small satellite tags on large Type A killer whales, probably the largest killer whales in the world.*

*Week of 1 December 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 -*

Leg 5 (of 5) of this survey continues off the coast of central California. A wide array of species have been encountered, including sperm whales in offshore waters; fin and humpback whales in nearshore waters; a minke whale; elusive Cuvier's and *Mesoplodont* beaked whales (the ship was able to stay with one group for two hours), pygmy sperm whales; and an assortment of striped dolphins, Risso's dolphins, and many, many (too many?) short-beaked common dolphins. On Nov 21, several subgroups of sperm whales were encountered, including some with young calves. This species echolocates (clicks) nearly continuously when diving, and the animals were first detected acoustically. A calm weather day brought an interesting patch of juvenile loggerhead turtles. And



Thanksgiving, a holiday that many spend with family, came went. Aboard a research vessel for weeks, to months, ship's and scientists tend to become a sort of family, and stewards Crystal and Justice put together an amazing Thanksgiving

and crew



dinner meal – complete with (non-alcoholic) strawberry mojitos and three different types of pie. See the survey website for more information,

including biweekly reports:

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact

[Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information. *Figures - Tracklines and sightings, by Beaufort sea state, completed during Leg 5; Tracklines completed during CalCurCEAS 2014. Photos – Juvenile loggerhead turtle (P. Olson); Sperm whale calf (M. Richie).*

### Week of 24 November 2014

California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 5 of CalCurCEAS departed San Francisco in beautiful weather on November 17. This is the last leg of the project, and we will try to complete all remaining transect lines during the coming weeks, returning to San Diego on December 10<sup>th</sup>. The first few days at sea have been varied, as we covered nearshore and offshore transects off central California in good weather, but also had one weather day with high swells and seas. We have encountered numerous humpback whales and fin whales, multiple female sperm whale groups, Dall's porpoise, short-beaked common dolphins with a few striped dolphins, and Risso's dolphins. We also recovered one of the DASBRs (a drifting acoustic recorder deployed on Leg 3) off the Big Sur coastline and were happy to confirm it successfully collected acoustic data during its 7-week meandering voyage from near Pt. Conception to just southwest of Pt. Sur. One interesting sighting this week was a fin whale with the typical white lower right jaw, but also with ancillary head ridges that are normally characteristic of Bryde's whales (photo). We will continue working our way southward during the coming days, trying to complete the transect lines far offshore of central California. See the survey website for more information, including biweekly reports:

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Photo (Paula Olson) – Fin whale with diagnostic white lower right jaw and atypical ancillary head ridge.*

*Week of 17 November 2014*

California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 4 of CalCurCEAS ended with a bang with our 3rd killer whale sighting; they have not been positively identified but look like Transients (see photo). This was the third killer whale sighting of this leg, with three different ecotypes seen. Details of the latter half of this leg are in the End of Leg 4 Report on the CalCurCEAS website (as well as detailed reports from other legs and survey details):

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.



*Week of 10 November 2014*

California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 4 of CalCurCEAS continues to have unseasonably good and warm weather though water temperatures have decreased from 24°C early in the leg to 17. Our highlight came last Sunday seeing a killer whale kill and retrieving the lungs and heart (details in mid-leg Report). All are excited for a genetic identification of the prey. There continues to be large numbers of short-beaked common dolphins with many small calves. We finally found some blue whales but the number of large baleen whales remains low. Sperm whales have been common but no groups of females and young have been seen. Leg 4 ends in San Francisco this week. See the CalCurCEAS website for detailed reports and survey details at:

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Week of 3 November 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 4 of CalCurCEAS is working the outer and southern portion of the study area and records the expected cast of*



characters: common and striped dolphins with the occasional lone sperm whale. The early part of the week had good seas and managed an excellent retrieval of a drifting acoustic buoy that had been



successfully recording data for three continuous months. The retrieval was just in time as the weather turned ugly with what is now the worst weather of the cruise. Although we eventually had to concede to the ill-tempered sea, we did

manage some effort in the early parts of the storm and the acoustics team was able to direct us to some unusual sounds. The visual team located a sei and fin whale but could not find the dolphin with the canary trill. See the CalCurCEAS website for detailed reports and survey details at:

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact

[Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information. *Photos – Lone male sperm whale; At dawn, scientists and crew pitch in to retrieve acoustic recording buoy after a 3-month drift at sea.*

*Green Turtle Ecological Research, San Diego Bay -* On October 30 the team captured 2 adult female green turtles. Both are recaptures from previous seasons. The first capture of the night was a turtle first captured in 1990 and this week's capture was the 17th time she's been captured over the last 24 years. When this turtle was first caught she weighed 24 kg and measured 54.4 cm in straight carapace length. Now, as a full-grown adult she weighed in at 134 kg, and 95.4 cm in carapace length. The second turtle was captured only once before, in 2002. She weighed only 48 kg at that time, and was 66.7 cm in shell length. Now, twelve years later, she's a full-grown, 135-kg female measuring 93.4 cm in shell length. Interestingly, the flipper tag applied 2002 was still on! It was removed and replaced with a new tag this week. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.

### *Week of 27 October 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 4 of CalCurCEAS started with kind weather that allowed two days of solid dolphin sightings. While short- and long-beaked common dolphins were dominant, the best sampling event was with bottlenose dolphins for a special project for Marissa Trego's graduate studies. The special RNA protocol took a team of runners and processors but was done successfully. We also added to the Pacific white-sided dolphin genetics project being done by Nikki Volmer at the Smithsonian. The acoustics team has been working seamlessly and launched another drifting acoustic buoy in the basin west of the Channel Islands, which puts it in prime beaked whale territory. The tracklines took us to the Mexican border and we continue to work in the southern and offshore portion of the study area. Surprises so far are the dearth of large whales and continued evidence of unusually warm conditions with 23C water, boobies and even a puffer fish. This leg will proceed westward and then northward, ending in San Francisco. See the CalCurCEAS website for detailed reports and survey details at:*

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact

[Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information. *Photo (Paula Olson) - Bottlenose dolphin destined to contribute to science with a biopsy for RNA study.*



*Week of 20 October 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 3 of this 5-leg, 120 sea day survey ended on Saturday, 18 October, in San Diego. The past week, ranging from 150 nautical miles west of San Diego to the Santa Barbara*



Channel and all around the Channel Islands has brought spectacular weather (whitecaps were rare); warm sea surface temperatures (up to 22.5C); the first record in California waters (that we are aware of) for *Feresa attenuata*, (pygmy killer whale); *Globicephala macrorhynchus* (short-finned pilot whale) and *Phocoenoides dalli*

(Dall's porpoise) in a single day (usually an odd combination due to different habitat preferences); two successful RHIB deployments (both with biopsy samples); deployment of two drifting DASBR buoys (to record cetacean vocalizations) and a bottom-mounted autonomous hydrophone (Ocean Noise Station #5); a guest scientist joining the ship in Santa Barbara; loggerhead turtles; wayward landbirds; and excellent food (the mean mass gain/individual/Leg 3 for the science party is estimated at 3.4kg). The Leg 3 report is posted on the CalCurCEAS website, along with previous reports and survey details at:



contact

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382>

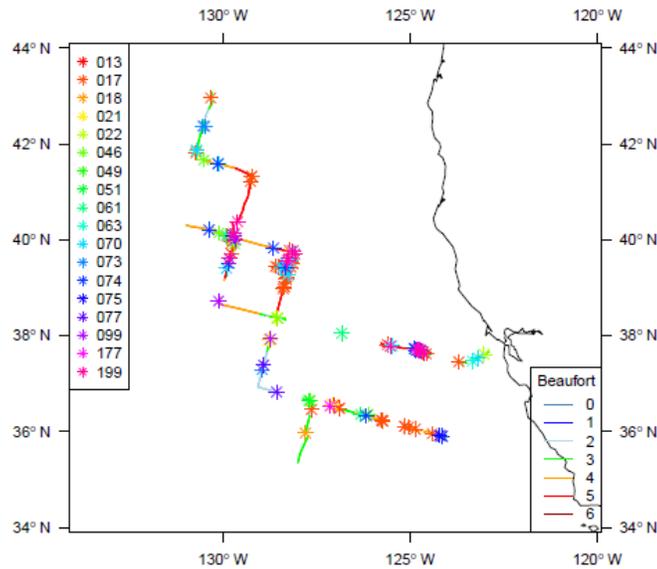
[Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Photos: juvenile loggerhead sea turtle basking offshore of San Diego (photo – Mridula Srinivasan); collecting data from pilot whales (photo – Adam U).*

*Pinniped Research and California Sea Lion Diet Studies -- Mark Lowry and Al Jackson will travel to San Nicolas Island during 20-22 October 2014 to collect California sea lion scat samples for diet analysis.*

*Week of 13 October 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10* – This past week, the project has been blessed with good-to-stunning weather (less than 10 knots of wind all day on some days). Marine mammal and seabird density has been very low; with the excellent sighting conditions, we can say so with high confidence. Balaenopterid whales and beaked common dolphin are the most prevalent species out here. Added to the have been a few sightings of Risso's dolphin, a timid group of bottlenose dolphin, a smattering of sperm whales, few Ziphiids. The map shows Leg 3 Beaufort sea state-scaled effort and marine mammal sightings. A highlight large chunk of squid brought to our attention by the three Black-footed Albatross scavenging on it. We are bringing a small piece home for identification. Acoustic, oceanographic, net tow operations continue to go smoothly. We are entering the final week 3, which ends in San Diego on Saturday, 18 October. See the project website for full reports: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.



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*Pinniped Research and California Sea Lion Diet Studies* -- Mark Lowry and Al Jackson will travel to San Nicolas Island during 20-22 October 2014 to collect California sea lion scat samples for diet analysis.

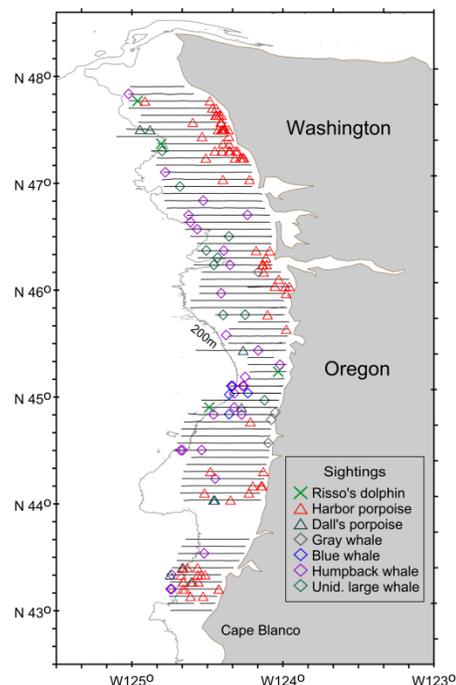
*Week of 6 October 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10* – The project has been surveying the far west of the study area at 40°N latitude (give or take a few degrees). This region is largely outside of the U.S. Exclusive Economic Zone and to the western edges of the influence of the California Current (as evidenced by the close-to-20°C surface water, tropicbirds, and flyingfishes recorded on several days). This past week brought workable-to-fine weather, 116 cetacean sightings including whales (fin, sperm, sei, blue) and gigantic schools of short-beaked common dolphin: 39 cetacean biopsy samples (including 4 from sperm whales), a retrieved DASBR passive recording buoy, plenty of photographs, oceanographic lows (a lost bongo net and non-functional starboard winch) and highs (a replacement frame and net and transfer of the CTD to the port winch), and extraordinary support from the ship's crew. The photo at right taken by Paula Olson shows a sperm whale blowing at the surface. The full mid-Leg 3 report is out today and posted on the survey website: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.



Contact

*Leatherback Aerial Survey, coastal northern California, Oregon, and Washington, 8–30 September* -- Scott Benson, Tomo Eguchi, Dan Prospero, Camryn Allen, and Joel Schumacher concluded aerial surveys for leatherback turtles and marine mammals over neritic waters of Oregon and Washington last week. Transects were completed adjacent to Cape Blanco, Oregon where the coolest sea surface temperatures were available within the study area (14°C). No leatherback turtles or aggregations of their primary prey, Pacific sea nettles (*Chrysaora fuscescens*), were encountered; however, other jelly species were observed in areas of extensive red tide that often characterize suitable leatherback foraging habitat. The completed surveys provide unique data during a year with unusually warm water temperatures along the U.S. West Coast, and will contribute to SWFSC's time series of leatherback occurrence patterns within the California Current Ecosystem. We are grateful for the support of NOAA's Aircraft Operations Center, their capable staff, and skilled pilots. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.



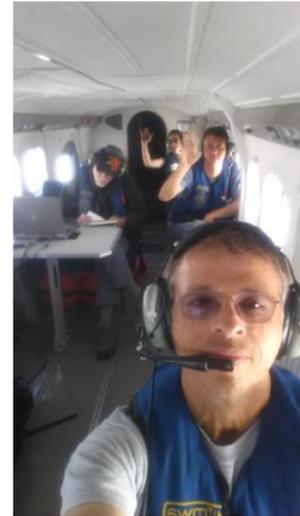
### *Week of 29 September 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10* — Leg 3 of this five leg survey began this past week (our planned survey lines are shown in the figure). The ship sailed on Thursday, 25 September, from San Francisco headed northwest to the far western edge of the survey area. New scientists this leg include Acousticians Amy Van Cise (SIO-MMTD doctorate student) and Michelle Wierathmueller (University of Washington), Ecosystem Samplers Jacob Youssefzadeh (Fisheries Ecology Division, SWFSC) and Morgan Martin (former USD-MMTD master's student), Visiting Scientists Charlotte Boyd (MMTD) and Mridula Srinivasan (NMFS Office of Science & Technology), Mammal Observer Robert Pitman (AERD), and Cruise Leader Lisa Ballance. They join Emily Griffiths (Acoustician), Juan Carlos Salinas, Paula

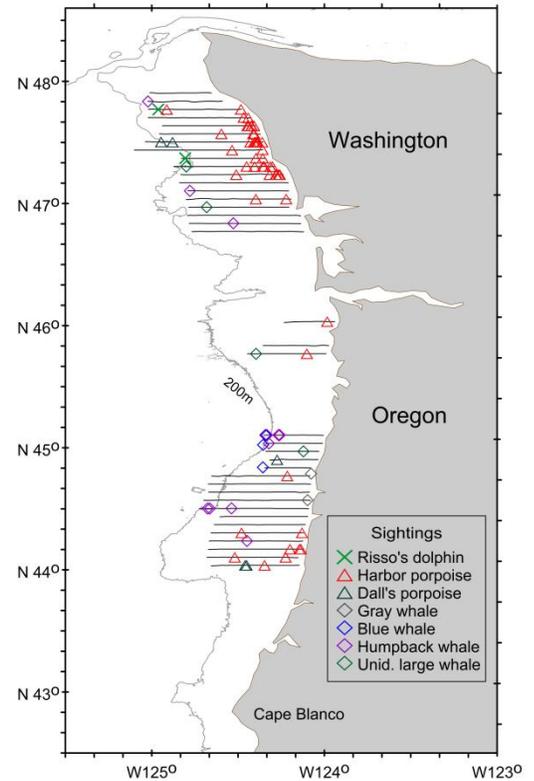


Olson, Suzanne Yin, Adam U, and Jim Gilpatrick (Mammal Observers), and Michael Force and Dawn Breese (Seabird Observers), who (with the exception of Gilpatrick) have been aboard since Leg 1. The first two days of Leg 3 saw fine weather (Beaufort 4 or lower) and plenty of Balaenopterid whales and common dolphins but at this writing we are steaming into Beaufort 6 and 3m swells with mammal observers on “recorder watch” (all other operations continue – so far). Contact Chief Scientist Jay.Barlow@noaa.gov for more information.

*Leatherback Aerial Survey, coastal northern California, Oregon, and Washington, 8 – 30 September -- Scott Benson, Tomo Eguchi, Dan Prosperi, Camryn Allen, and Joel*



Schumacher are conducting aerial surveys for leatherback turtles and marine mammals from a NOAA Twin Otter over neritic waters of Oregon and Washington. Transects have been completed off the Washington Coast and central Oregon, including a northern polygon of interest to, and also being surveyed as part of CalCurCEAS, the Bureau of Energy Management. As was the case in neritic California waters, sea surface temperatures on the northwest coast are unusually warm. No leatherback turtles have been sighted. Aggregations of Pacific sea nettles (*Chrysaora fuscescens*) have been scarce and patchy although ocean sunfish (*Mola mola*) have been abundant. The team encountered two entangled humpback whales: one 20 miles west of Newport, Oregon, and another off the coast of the Olympic Peninsula. Both entanglements were reported to NOAA’s whale entanglement network. The team expects to complete the surveys this week once weather conditions improve. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.



### Week of 22 September 2014

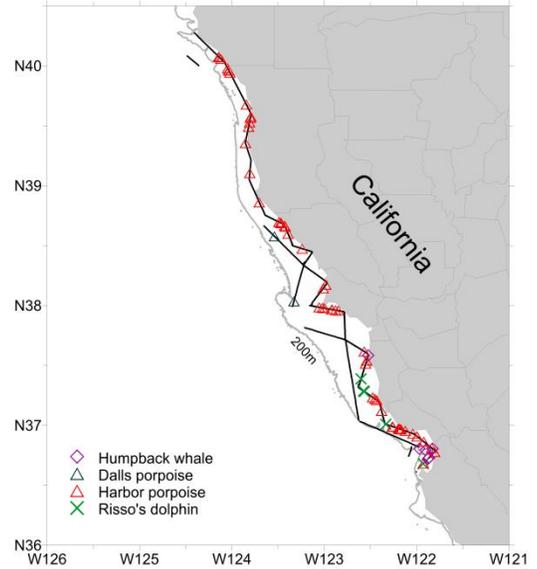
California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10 – Leg 2 of this 5-leg survey ends this week. A synopsis from Cruise Leader Eric Archer: Although we've had our share of rough weather, our final week of Leg 2 has also given us some of our busiest days. The most action happened midweek on the 16th during an eastward transect towards the Oregon/California border. From the start of effort to late-afternoon, we were pelted with sighting after sighting of humpbacks (*Megaptera novaengliae*) and fin whales (*Balaenoptera physalus*) to the point that there was hardly a region to look in that didn't have whales blowing. As if the whales weren't keeping us busy, we also had several sightings of Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) and our first sightings of the leg of northern right whale dolphins (*Lissodelphis borealis*), some of which were seen riding the bow wake of a fin whale. To cap it all off the day ended with a close encounter with some blue whales (*Balaenoptera musculus*) from which we got a biopsy and some good photos. The following day, we started at the same point, but headed south. The balance shifted to a predominance of fin whales. In fact, fin whales have been the most frequently sighted species on this leg, so if anyone is missing some, we know where they are. During this leg, transits over several seamounts have treated us to sightings of sperm whales as well as a couple of groups of Baird's beaked whales. Interestingly, after looking through the photos, one of the sperm whales seen on September 13th turned out to be the same as a whale that was seen almost a month ago on the first leg on August 18th, approximately 220 nm to the northwest. Leg 3 begins this coming Thursday. The full Leg 2 report as well as previous reports and photos are posted on the survey website: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Leatherback Aerial Survey, coastal northern California, Oregon, and Washington, 8 – 30 September* – Scott Benson, Erin LaCasella, Dan Prospero, and Joel Schumacher completed aerial surveys for leatherback turtles and marine mammals from a NOAA twin otter over neritic waters off central and northern California last week.



Pacific sea nettles

*(Chrysaora fuscescens)*, the primary prey of leatherbacks in neritic California waters, were scarce south of Point Reyes where they are usually abundant. Small aggregations of sea nettles were encountered off Point Reyes and the Mendocino County coast, although no leatherback turtles were sighted. The most noteworthy sighting was a group of 250-300 long-beaked common dolphins (*Delphinus capensis*) that was encountered on the north side of Point Reyes. This is unusually far north for this warm-water species. The team transited to Astoria, Oregon and was joined by Tomo Eguchi and Camryn Allen for surveys of neritic waters off Oregon and Washington. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information. *Map – Aerial survey lines and sightings of cetaceans during the leatherback survey.*



*Southern California Behavioral Response Study (BRS), Channel Islands and surrounds, 7-19 September* – The second week of the BRS research cruise aboard the sailing vessel R/V *Derek M. Baylis* was completed on Friday, Sep 19<sup>th</sup>. Weather conditions were challenging and efforts were mainly restricted to more protected waters inshore of Catalina and San Clemente Islands. Beaked whales remained elusive and were not observed visually, but the acoustic team detected echolocation clicks that were likely produced by a *Mesoplodon* beaked whale, rarely encountered during the 5-year project off Southern



California. Burst pulses, including some high frequency downsweeps characteristic of killer were also detected on multiple days. Other acoustic and visual detections included short- and long-beaked common dolphins, bottlenose dolphins, Risso’s dolphins, blue whales, and whales. During the second week of this project,

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multi-vessel research team coordinated with naval activities, and mid-frequency sonar was recorded on two separate days using the towed array and a free-floating DSG acoustic recorder. The SWFSC team included Karin Forney (cruise leader & observer), Jennifer Keating (lead acoustician), and Nicky Beaulieu (acoustician). Participants from Cascadia Research included Sophie Webb and Katherine Whittaker (both members of the visual survey team). Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

### *Week of 15 September 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10* – The mid-Leg 2 report is out – and posted on the survey website (along with additional reports and photos):

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> . Highlights include: a second high spatial resolution survey of the BOEM region of interest near Newport, Oregon; sei whale (with biopsy sample); northward displacement of seabird species (Guadalupe and Scripps’s murrelets, Brown Booby, all off the Oregon coast); 53 biopsy samples collected; individuals of 4 cetacean species identified photographically (sei, fin, blue, and short-finned pilot whales); CTD casts, squid jigging, and vertical net tows added to ecosystem sampling; passive acoustic cetacean detections total 12 species. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Leatherback Aerial Survey, coastal northern California, Oregon, and Washington, 8 – 30 September* – Ongoing. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.

*Southern California Behavioral Response Study (BRS), Channel Islands and surrounds, 7-20 September* - The at-sea team completed their first week of field effort for this multi-institutional study tagging whales and dolphins to determine their responses to real and simulated Navy sonar. The role of the scientific team aboard the R/V *Derek M. Baylis* is to use acoustic and visual methods to locate beaked whales and other target species for tagging and behavioral studies. Acoustic detections this week included Cuvier’s beaked whales, Risso’s dolphins, bottlenose

dolphins, short-beaked common dolphins, killer whales, and blue whales, with most detections confirmed visually. The new tetra-torpedo towed hydrophone array, designed by Jay Barlow, is functioning well from the *Baylis* at speeds of up to 9.5 kts, providing enhanced capability to localize animals and rapidly reach areas of beaked whale occurrence. Two successful deployments of a free-floating acoustic recorder (Loggerhead Instruments DSG) were also completed. The team is re-provisioning in San Pedro over the weekend and will continue field efforts around the Channel Islands on Sunday. The SWFSC team includes Karin Forney (cruise leader & observer), Jennifer Keating (lead acoustician), and Nicky Beaulieu (acoustician). Participants from Cascadia Research include Sophie Webb and Katherine Whittaker (both members of the visual survey team). Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

#### *Week of 8 September 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US EEZ +, August 5 – December 10* – The *Ocean Starr* has been stuck in poor weather conditions offshore of Oregon for the past few days, but weather is predicted to improve. A detailed mid-leg 2 report will be included next week. See the survey website for additional reports and photos:

<https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> . Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Leatherback Aerial Survey, coastal northern California, Oregon, and Washington, 8 – 30 September* - Scott Benson, Erin LaCasella, Dan Prospero, and Joel Schumacher begin aerial surveys of leatherback turtles and marine mammals in neritic US west coast water this week. Surveys off central and northern California will be conducted from a NOAA twin otter aircraft and originate from Monterey, California through 16 September. The team will transit to Astoria, Oregon on 17 September and be joined by Tomo Eguchi and Camryn Allen for surveys of Oregon and Washington waters through 30 September. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.

*Southern California Behavioral Response Study (BRS), Channel Islands and surrounds, 8-19 September* - The purpose of this multi-institutional study is to tag whales and dolphins to determine their responses to real and simulated Navy sonar. The SWFSC team will work aboard the R/V *Derick M. Baylis*, chartered by Cascadia Research, and use acoustic and visual methods to aid the team in finding whales to tag, particularly beaked whales and sperm whales. Participants from SWFSC include Karin Forney (cruise leader & observer), Jennifer Keating (lead acoustician), and Nicky Beaulieu (acoustician). Participants from Cascadia Research include Sophie Webb and Katherine Whittaker (both members of the visual survey team). Shannon Rankin (field coordinator) will drive the team to their starting location (Long Beach) and pick them up at the end of the project. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

#### *Week of 2 September 2014*

*California Current Cetacean and Ecosystem Assessment Survey, US West Coast, August 5 – December 10* – Leg 1 of the survey ended this past week in Newport, OR. See the survey website for additional reports and photos: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> . Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Hawksbill sea turtle surveys and capacity building workshop, Isla Coiba, Panama, 3-11 September 2014* — Jeff Seminoff will travel to Panama to conduct capacity building training course for Panamanian sea turtle biologists and to provide technical assistance for in-water biological research on endangered hawksbill sea turtles at Isla Coiba. The Coiba Island National Park has long been suspected as a key area for hawksbill turtle foraging, but so far no systematic surveys have been conducted. This site is among the last several areas for which we know nothing about this endangered species; a better understanding of Coiba's importance is key for filling out a hawksbill conservation plan for the eastern Pacific. Seminoff's travel is partially sponsored by ICAPO (Eastern Pacific Hawksbill Initiative NGO) and is in cooperation with Dirección General de Investigación y Desarrollo (ARAP; Panama) and the Panamanian Navy.

*Week of 25 August 2014*

*Northern Resident Killer Whale Research, Vancouver Island, BC, August 11-31*



This was another very successful week for the crew aboard the R/V Skana (John Durban & Holly Fearnbach, MMTD; Lance Barrett-Lennard, Vancouver Aquarium). Thirty six flight missions were successfully completed using the APH-22 marine hexacopter (56 flights in total for project, representing 12.5 hours of combined flight time). To date, 18920 overhead images have been obtained from Northern Resident killer whales, comprising 72 different whales from 12 matriline. In addition, boat-based laser-metric images have been collected from most of these whales. Field work for this project will end this coming week, and our task will turn to analyses of these substantial datasets. Together, photogrammetric measurements from these images will be used to assess long-term growth trends and current body condition, which will be compared

to similar metrics from endangered southern resident whales. *Photographs - Aerial of the I15 matriline showing variance in body lengths for of different ages. Comparative condition for two adult male NR whales; poor condition on left ID = A37, 37 years old; note depression behind skull) contrasted with robust condition right (I47, 29 years old). Photos from an altitude >100ft using APH-22 hexacopter. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for information.*



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*California Current Cetacean and Ecosystem Assessment Survey, US West Coast, August 5 – December 10* – Leg 1 of the survey ends this week when the ship pulls into Newport, OR on Wednesday. See the survey website for reports and photos: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> . Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

*Week of 18 August 2014*

*Northern Resident Killer Whale Research, Vancouver Island, BC, August 11-31* – Scientists from SWFSC (Wayne Perryman, John Durban, Holly Fearnbach) and Vancouver Aquarium (Lance Barrett Lennard) have completed the first week of a collaborative study to investigate the body condition of Northern



Resident killer whales based on vertical aerial images taken from a small hexacopter (developed by Aerial



Imaging Solutions, Old Lyme, CT). In three days of flying, the scientists have conducted 20 flights, almost 5 hours of flight time. The new marine version of the APH-22 hexacopter incorporates a series of modifications specifically targeted to meet the challenges of sampling at sea from small moving platforms. So far it has performed flawlessly and the high resolution aerial images we are collecting will allow us to identify individual whales and determine their body condition based on measurements of size and shape. In preparation for the this study, the flight team of John Durban and Holly Fearnbach spent several days in the acoustic test tank at SW Center honing their skills in hand launching and catching a small quadcopter. This effort has paid off as they have transferred this training into seamless launches and recoveries from the flying bridge of the Vancouver Aquarium's small research vessel *Skana*. To date, we have excellent vertical images of ~30 distinct whales, including images that allow us to detect some whales in poor body condition and others that are clearly pregnant. Additionally, laser-metric images are being collected from the boat platform to estimate whale body length to assess long-term growth trends from length vs. known-age relationships. A great start, with most of the field effort still ahead of us. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Harbor Porpoise Passive Acoustic Research, Monterey Bay, CA, Ongoing* – Eiren Jacobson (SIO student) and Karin Forney successfully assembled and deployed a network of 11 passive acoustic moorings in Monterey Bay (see map) during late July and early August, 2014. The archival instruments (C-PODs) will monitor harbor porpoise occurrence in northern Monterey Bay for about 4-5 months, and are expected to be retrieved in December 2014 or early January 2015. The study was funded by the California Institute for Energy and Environment and is a collaborative project involving Dr. Jim Harvey at Moss Landing Marine Laboratories (MLML), Karin Forney at SWFSC, and Eiren Jacobson (SIO). Captain John Douglas of MLML Small Boat Operations provided excellent vessel support



aboard the R/V *Sheila B*, and several MLML scientific divers assisted with the installation of 6 fully- retrievable, shallow-water moorings secured with sand anchors. The remaining 5 deep-water moorings included an acoustic release and an expendable concrete anchor. This is the second year of acoustic sampling for this project, providing data on interannual variability in harbor porpoise occurrence patterns. The two years of acoustic data, combined with past aerial survey data in Monterey Bay, will be analyzed by Eiren Jacobsen as part of her doctoral research. The goal is to identify design criteria for the use of passive acoustic methods to monitor trends, abundance, and potential impacts of marine renewable energy facilities (or other anthropogenic activities) on harbor porpoise off California. Contact [Karin.Forney@noaa.gov](mailto:Karin.Forney@noaa.gov) for more information.

*California Current Cetacean and Ecosystem Assessment Survey, US West Coast, August 5 – December 10*

– The first half of Leg 1 of this survey has been completed and with it comes our first full report, appended to the end of this document. All reports and additional information will be posted at the survey website: <https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=259&id=19382> . Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) (Chief Scientist of the survey) for more information.

### *Week of 11 August 2014*

*Northern Resident Killer Whale Research, Vancouver Island, BC, August 11-18* – This week John Durban, Wayne Perryman, and Holly Fearnbach will begin a new collaborative field study to "Assess growth trends and body condition of killer whales to infer nutritional status". This study will focus on the Northern Resident population of killer whales off Northern Vancouver Island, Canada, and is a collaborative study with the Vancouver Aquarium Marine Science Center (Lance Barrett-Lennard) and Aerial Imaging Solutions (Don LeRoi). Estimates of length will be made using boat-based laser photogrammetry to inform long-term growth trends, and widths will be measured from vertical photographs collected using an unmanned aerial system (hexacopter) to infer current nutritional status. These metrics will be related to trends in returning Chinook salmon (their primary prey) in past decades, and will be compared to those existing for the endangered Southern Resident killer whale population that aggregates in adjacent U.S. and Canada boundary waters off Southern Vancouver Island to provide a comparative assessment of nutritional status to guide management of these two protected populations.

*Southern California Green Turtle Research, Seal Beach National Wildlife Refuge, 5-6 August* – The SWFSC turtle team conducted field capture efforts last week and captured two juvenile green turtles. Ultrasonic transmitters were attached to each turtle and will be tracked with a remote array of fixed-station hydrophones. This tracking research is with a collaboration with CSU-Long Beach and has been ongoing for 3 years at Seal Beach and in the San Gabriel River. The Seal Beach study site (see photo below) is a ~10 hectare saltwater ‘pond’ that is >1 mile inland and only accessible via small drainage channels. It is a unique habitat for green turtles in Southern California. Contact project PIs Jeffrey Seminoff, Tomo Eguchi, and Robin LeRoux for more information.



*California Current Cetacean and Ecosystem Assessment Survey, US West Coast, August 5 – December 10* – The first leg of the California Current Cetacean and Ecosystem Assessment Survey (CalCurCEAS) got underway last

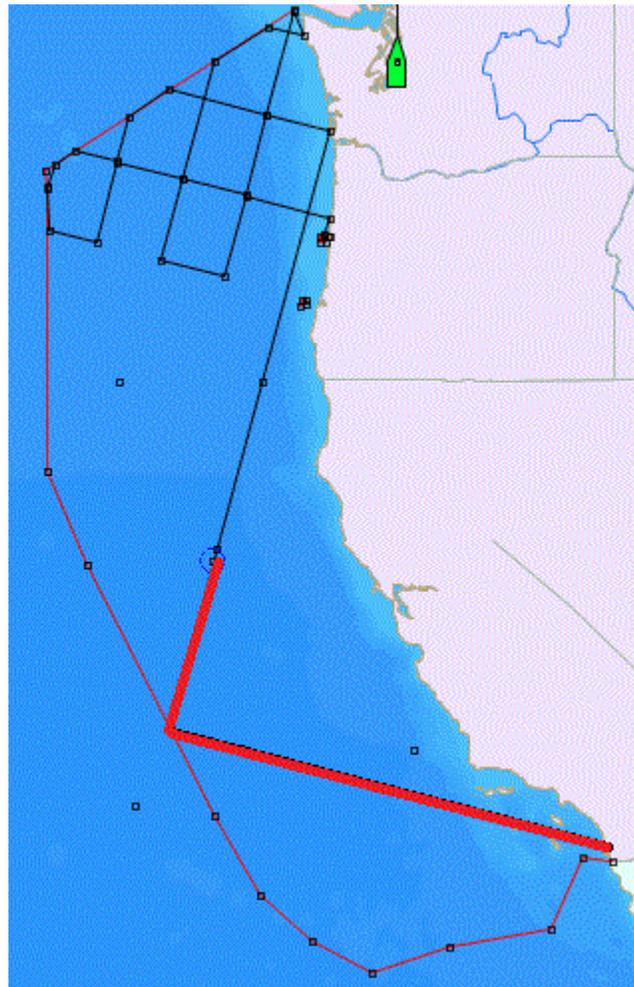
Tuesday, Aug 5 aboard the R/V Ocean Starr (formerly the David Starr Jordan). A great science team has been assembled, including the marine mammal visual survey team (Paula Olson, Juan Carlos Salinas, Suzanne Yin, Adam U, Morgane Lauf, Jeff Moore, and Bennie Johnson), the acoustic survey team (Emily Griffiths, Eiren Jacobson and Susanna Calderan), the oceanography department (Annette Henry), the seabird survey team (Mike Force & Dawn Breese), and visiting scientist Yaiyr Astudillo Scalia. This international team includes participants from Mexico, Canada, the U.K. and Venezuela. The captain and crew are extraordinarily helpful and the ship is in good working order.

The first five days of survey effort took us from the head of La Jolla Canyon between San Clemente and Catalina Islands and then offshore to the western edge of the study area. Currently we are headed north on a transect line that will bring us close to shore at mouth of the Columbia River (see map). So far, the weather has been fairly rough, with winds between 15 kts (on a good day) to 25 kts. Despite the winds, we have seen many marine mammals, especially short beaked common dolphins, blue whales and fin whales. Of the unusual group of things we have seen, some of the best were a group of bow-riding striped dolphins (not usually so friendly), more Bryde's whales than normally seen this far north, two groups of Baird's beaked whales (usually rare), and a group of pilot whales (also rare off California since the 1983 El Nino). We even got a biopsy from the pilot whale! The acoustics team recorded great vocalizations from the Baird's whales, pilot whales and Risso's dolphins and managed to detect and localize a large male sperm whale that avoided detection by the visual team (by hiding underwater). The acoustic team also recorded blue whale calls during their evening sonobuoy station and recorded a couple calls from a Bryde's whale. The acoustics team deployed three drifting buoy recorders that will be up later this year. The birder team spotted a Fernandez Petrel (1200 miles north of its usual range).

The acoustics team is experimenting with a new tetrahedral hydrophone array (dubbed the X-array), which was developed in collaboration with the PIFSC and Scripps Institution's Marine Physical Lab to improve 3-D localization capabilities. Unfortunately, this array spins too much to be useful, and some additional modifications are needed. Our tried-and-true oil-filled linear hydrophone arrays are working well and we are able to localize dolphins and some small whales.

The oceanography team is taking regular temperature profiles with an XBT and is collecting bongo net samples whenever conditions are calm enough. Continuous underway temperature, salinity, and acoustic backscatter data are also being collected. Sea surface temperatures have varied from 23.4°C off San Diego to 17.3°C at our last XBT station.

The team out here is extraordinarily grateful for all the shore-side support provided in preparation for this cruise, including efforts by Annette Henry, Shannon Rankin, Lisa Ballance, Jeremy Rusin, Libby Williamson, Jessica Redfern, Paul Fiedler, Robert Holland, Al Jackson, Lynn Evans, Gaby Serra-Valente, Nicky Beaulieu, Nick Kellar, Barb Taylor, Karen Martien, Wayne Perryman, Eric Archer, Jennifer Keating, Annette Stern, Terry Henry, Tony Cossio, Roger Hewitt, Jessica Lipsky, Cisco Werner, Kristen Koch and our families. Email is very slow out here, and we may not be able to respond at all on some days. Please bear with us if we seem



**Figure 2** Transect lines planned for Leg 1 (black lines) and our progress to date (bold red line).

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unresponsive. More complete reports are planned on 12-day intervals (mid-leg and end-of-leg). Reported by Jay Barlow, Chief Scientist and Leg 1 Cruise Leader ([jay.barlow@noaa.gov](mailto:jay.barlow@noaa.gov)).

*2014 SOCAL Behavioral Response Study, Southern California, August* – The marine mammal acoustics group completed participation in Leg 1 of the Navy-sponsored Behavioral Response Study (BRS). Jennifer Keating and Anne Simonis (SIO graduate student) helped acoustically detect marine mammals in Southern California waters (blue and pilot whales, and Risso's, bottlenose and common dolphins). Successful implementation of a new tetrahedral hydrophone array designed by Jay Barlow (with funds provided by NOAA's Advanced Sampling Technology Working Group) allowed for improved detection and localization of animals at a higher vessel speeds than previous designs. All around efforts resulted in multiple tagging of animals and playback experiments with simulated Navy sonar.



### *Week of 4 August 2014*

The California Current Cetacean and Ecosystem Survey (CalCurCEAS) is leaving out of San Diego on Tuesday, August 5 aboard the R/V *Ocean Starr* (previously the *David Starr Jordan*). The survey will include 120 days at sea covering the entire US west coast (out to a distance of 300 nautical miles) and returning to San Diego on December 10. This survey is sponsored jointly by NOAA, Navy, and the Bureau of Ocean Energy Management (BOEM). This survey will cover a grid of transect lines (see Figure) similar to the grids covered on previous ORCAWALE and CSCAPE cruises in 1996, 2001, 2005 and 2008. Research will include visual and acoustic line-transect surveys for whales, dolphins and porpoises, photo-identification studies, biopsies for future genetic and other studies, seabird surveys, and ecosystem sampling (bongo net tows, surface salinity & temperature, acoustic backscatter, and, on legs 2-4, CTDs). Participants will include representatives from many programs within the Marine Mammal & Turtle Division. Expanded ecosystem sampling on Legs 2-4 is being provided by the Fisheries Ecology Division in Santa Cruz. Planning, financial support and coordination for this survey have been provided by Annette Henry, Jeremy Rusin, Lisa Ballance and Shannon Rankin, with help from many others.

Leg 1 (05-27 Aug) will include a straight run offshore followed by a run up to the mouth of the Columbia River (see Figure). We hope to cover most of the waters off Washington and northern Oregon on Leg 1, ending in Newport, OR.

Cruise orientation and training will occur in the Stenella Room from 9am-5pm on Monday, Aug 4. Due to space limitation in that room, we ask that interested non-cruise personnel attend by Webinar:

#### Meeting information

Topic: CalCurCEAS Training and Orientation Date: Monday, August 4, 2014

Meeting Number: 748 762 278

Meeting Password: training

To start or join the online meeting

Go to <https://mmancusa.webex.com/mmancusa/j.php?MTID=mf7d1776aeb5fdcc10581097d4a1b62e0> --

Teleconference information Call-in toll-free number (Verizon): [1-866-692-3582](tel:1-866-692-3582) (US) Call-in number (Verizon): [1-866-692-3582](tel:1-866-692-3582) (US) Show global

numbers: <https://clicktojoin.verizonbusiness.com/wbbcClick2Join/servlet/WBBCClick2Join?TollNumCC=1&TollNum=866-692-3582&TollFreeNumCC=1&TollFreeNum=866-692-3582&ParticipantCode=1911940&customHeader=mymeetings&dialInNumbers=true>

Host access code: 191 194 0 Attendee access code: 191 194 0

Contact: Jay Barlow, Chief Scientist ([jay.barlow@noaa.gov](mailto:jay.barlow@noaa.gov)).

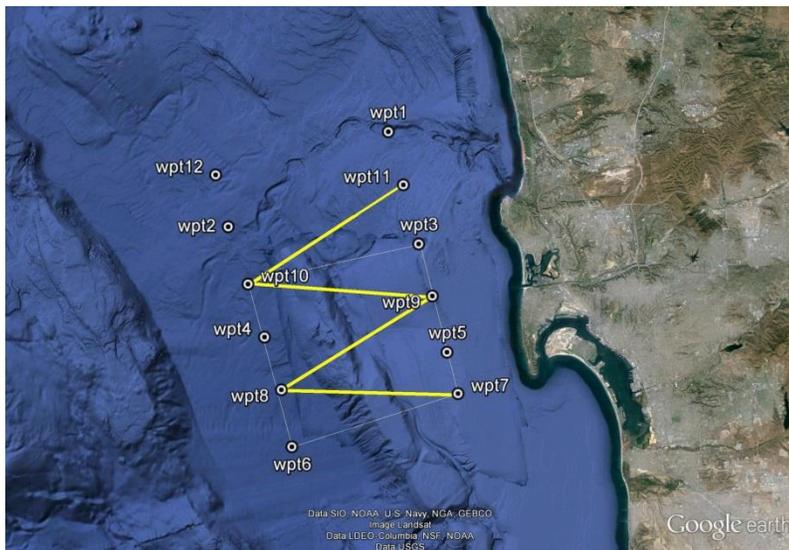


*CalCurCEAS planned transect lines*



*Leg 1 planned transect lines*

*Blue Whale Survey, San Diego, August 1* – On 1 August, members of MMTD and Scripps Institution of Oceanography conducted a boat-based line-transect survey for blue whales off of San Diego. A total of 9 blue whales and 1 fin whale were sighted. This work is part of a Ph.D. study by SIO student Cat Nickels that is investigating euphausiid and blue whale distribution. For more details contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov)



*Southern California Green Turtle Research, Orange County, California, August 5-6* — SWFSC marine turtle researchers Jeff Seminoff, Dan Prosperi, and Joel Schumacher will travel to Orange County to continue field capture efforts with green turtles in Seal Beach National Wildlife Refuge and San Gabriel River. This research is a collaboration between CSU - Long Beach and the Long Beach branch of the West Coast Regional Office (NOAA). Contact Jeff Seminoff for more information.

*Gulf of Mexico Leatherback Turtle In-Water Capture and Satellite Telemetry, Destin, Florida, August 3-16* — Scott Benson will travel to Florida to participate as an invited expert in efforts led by SEFSC to capture and tag free-swimming leatherback turtles in the Gulf of Mexico. Although a pelagic longline fishery regularly interacts with leatherbacks in the Gulf of Mexico, little is known about distribution, movements, or origins of leatherbacks in the Gulf. The project aims to attach satellite-linked transmitters to eight turtles, and will be the first attempt to sample free-swimming leatherbacks in the Gulf of Mexico. Benson will provide technical training, advice, and expertise to the SEFSC team, based on his extensive experience capturing leatherbacks off central California.

*Northern Great Barrier Reef Sea Turtle Research, Howick Islands, Australia, August 9-September 3* — SWFSC marine turtle researchers Tomo Eguchi, Michael Jensen and Camryn Allen are traveling to the Howick Group of remote islands off the northern Great Barrier Reef, Australia. They, along with several Australian researchers, join a study on green turtles called ‘Rivers to Reef to Turtles,’ lead by Ian Bell (Queensland Government’s Department of Environment and Heritage Protection) and Christine Hof (WWF) from August 15 – September 3. The goal of the project is to determine whether exposure to land-based pollutants is adversely affecting coastal green turtle populations of the Great Barrier Reef. The mass stranding of green turtles in 2012 along the northern coast of Queensland and subsequent strandings of green turtles in 2013 and 2014 have raised concerns about effects of land-based pollutants on the health of green turtles. The Howick group of islands is used as a control site, where no land-based pollutants should exist. In addition to sampling for the pollution study, the research group will collect data to determine genetic origin (Jensen) and estimate sex ratio (Allen) and demographic parameters (Eguchi). For more information please contact Tomo Eguchi, Michael Jensen, or Camryn Allen.

*Resolution Testing for Unmanned Aerial Systems, Central California, August 5* — Morgan Lynn and LTJG Kelly Schill are travelling to Vandenberg AFB on Tuesday to conduct resolution testing for one of NOAA’s Puma UAS platforms. Poor resolution of images from the camera system in the Puma has made it only of marginal use in Fisheries applications and it is hoped that either an upgrade to the Puma system or selection of an alternative small fixed wing platform will correct this problem moving forward.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general). As the season winds down, the island continues to be in drought conditions, but we are still getting 1-3 nests hatching per night. This weekend, Tropical Storm Bertha is forecast to pass near to Sandy Point, and may give some much-needed rain to the island (and will probably disrupt sampling for a day or two). We have now sampled 4,405 hatchlings from 125 nests. Additionally, we surpassed our milestone of 30,000 samples collected on this project over 6 seasons! For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).



Erin LaCasella (left) hatched during the daytime. monitors an emerging nest



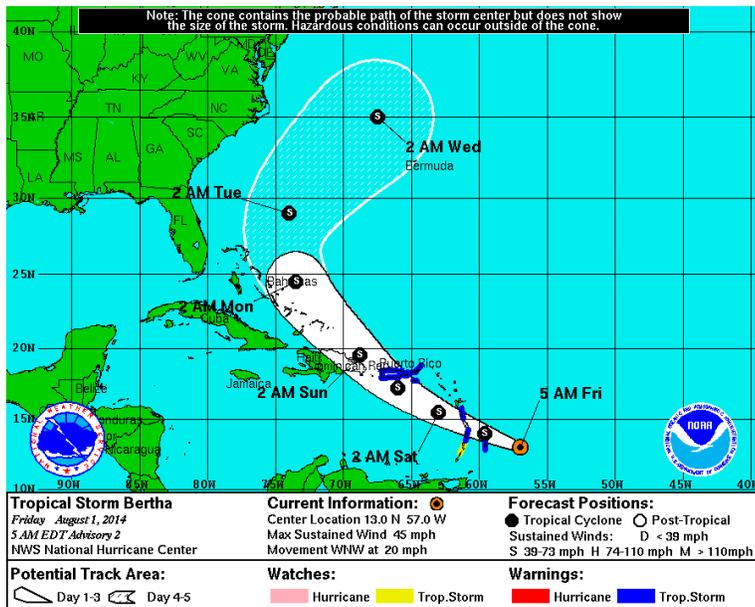
examines tracks from a disoriented nest that Claire Gonzales (Duke University student) (right). Photo: Kelly Stewart.



One of these is turtle number 30,000! Peter Dutton, Kelly Stewart and Mike Evans (USFWS) mark the project milestone and discuss continuation of collaborative inter-agency program.



Tracks leading away from a nest, going in all directions. The nest hatched during the day and hatchlings were disoriented (Photo: Kelly Stewart).



Tropical Storm Bertha eyes up St. Croix.

### Week of 28 July 2014

*Aerial Photographic Survey of California Sea Lions, Southern and Central California, July 7-10* – An aerial photographic survey of California sea lions at the Channel Islands in southern California was completed by Mark Lowry and Stephanie Nehasil during July 7-10. Currently, Mark Lowry is on standby for an aerial survey of northern fur seals and California sea lions at the Farallon Islands until an aircraft is available sometime after July 31. The Farallon Islands survey is a collaborative study between Point Blue Conservation Science, US Fish and Wildlife Service, and SWFSC. SWFSC will provide vertically mounted digital camera equipment and camera operator, and Point Blue Conservation Science provides the aircraft, with all involved getting copies of the digital photographs. The survey will demonstrate the value of the high quality vertical digital-photographs obtained by SWFSC as compared to hand-held digital photographs that the collaborators typically use.

*California Sea Lion Diet Studies, San Nicolas Island, July 28-30* – Mark Lowry and Sam McClatchie (FRD) will conduct pinniped field studies at San Nicolas Island during 28-30 July. While at the island they will collect 100 California sea lion scat samples for diet studies.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general). Sampling progressed steadily this week, reaching a total of 85 nests and 3,899 hatchlings for the season. The NOAA team’s research activities enhance US Fish & Wildlife Service’s nest management objectives since our presence on the beach at dusk enables significant reduction of predation on emerging hatchlings (see photos). Erin LaCasella joins the team at the end of the week to help close out the season. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).



Vicki Pease and Kelly Stewart huddle over a nest to protect emerging hatchlings from an aggressive frigate bird (photo: Emma Dutton).



The team sets up their biopsy sampling station on the beach (left to right: Vicki Pease, Christina MacMillan, Claire Gonzales, Kelly Stewart and Emma Dutton; Photo by Peter Dutton).



Peter Dutton with student volunteers (photo: Donna Dutton)



Vicki Pease and STAR teacher Christina MacMillan collect a bag of emerging hatchlings (photo: Peter Dutton)

*2014 SOCAL Behavioral Response Study* – This week the marine mammal acoustics group will begin a 2-week research project as part of the Navy-sponsored Behavioral Response Study (BRS). Jennifer Keating will be leading this effort (starting Monday) on the charter vessel Truth. She and SIO graduate student Anne Simonis will use a towed hydrophone array to help detect beaked whales and sperm whales for the BRS team. Once these and other focal species are found, they will be tagged and exposed to simulated Navy sonar sounds. Their behavior and received sounds will be recorded on the tags for later analysis to determine how they react to Navy sonar. Shannon Rankin drove the team up to Long Beach to start this trip on Sunday.

*Week of 21 July 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general).

The field season’s total number of hatchlings sampled has now passed 3,000 from 83 nests. Vicki Pease and Peter



Dutton joined the team last week, as did volunteers Emma, Diana and Donna Dutton - to help with the expected surge in hatchling emergence in the upcoming week. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov). Photos by Donna Dutton: Volunteers Emma Dutton and Micaela McDonald assist Kelly Stewart with sampling; Hatchlings heading to the water.



*Passive Acoustics Testing Cruise, San Diego, July 16* - The marine mammal acoustics group conducted a gear-test cruise on the fishing vessel *Horizon* out of H&M landing (funded with co-op program funds). Two designs of a towed tetrahedral hydrophone array were tested: the X-array and the Torpedo (see figures). Previous tests of both arrays showed problems. Current tests showed that the modifications



made to X-array were successful at quieting the flow noise and that modifications made to the Torpedo were successful in eliminating the spinning

problem seen earlier. The towed tetrahedral arrays are being developed jointly with the PIFSC using ASTWG funding.

Also tested were two DASBR buoy recorders and one traditional hydrophone array. The test cruise effort was led by Shannon Rankin, with the aid of Emily Griffiths and Jennifer Keating. Also aboard helping were Brittany Hancock-Hanser, Nicky Beaulieu, Symone Gyles, Sam Woodman, Alex Curtis, and Ciaran Gallagher. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.



*Hawksbill and green turtle research in El Salvador and Nicaragua, 7-18 July* - Tomo Eguchi traveled from Bahia Jiquilisco, El Salvador, to Estero Padre Ramos, Nicaragua, on Saturday (12<sup>th</sup>) to meet with local researchers, learn about their field research, and discuss future collaboration. Padre Ramos is a field site of ICAPO (Iniciativa Carey del Pacifico Oriental or Eastern Pacific Hawksbill Initiative; <http://www.hawksbill.org>) and FFI (Fauna and Flora International; <http://www.fauna-flora.org>) and is thought to be the largest nesting beach complex for the endangered eastern Pacific hawksbill turtle, where almost 100% of nests have been monitored since 2010. Approximately 85% of nests are relocated to a protected hatchery since the conservation project was initiated in 2010. The remainder are monitored for hatching success *in situ*. Approximately 100 hawksbill turtles nest annually in this area. Eguchi participated in nightly beach patrol, tagging/measuring of nesting hawksbill females, and relocation of eggs to the hatchery. He also participated in the first successful in-water capture of hawksbill turtles (five juveniles were captured in two days). On his way to San Diego, he will meet with coordinators of FFI in Managua, Nicaragua, to discuss future collaboration and research priorities. For more information, contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov).



*Pinniped Ecological Research, Southern California Bight, Quarterly* - Jim Carretta and Stephanie Nehasil are traveling to San Clemente Island from 18-21 July to conduct a California sea lion census and to collect scat samples for ongoing diet analyses. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

*Week of 14 July 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general). Hot and dry conditions continued last week with red flag warnings throughout the islands (high fire danger). The number of hatchlings emerging continues to be high and the team is sampling between two and four nests per night with an average of 36 hatchlings per nest. The number of hatchlings sampled now stands at 2,427. A late-season nesting female was a surprise on Thursday night for Liz Hetherington’s (Boyd Lyon Sea Turtle Fund



Scholar) final night with the team. The turtle nested in an erosion zone and Liz was keen to help with egg catching and relocation. The turtle slipped back into the moonlit water at 2:36 am. Vicki Pease and Peter Dutton join the team this week. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov). Photos by STAR teacher researchers:



An abundance of hatchlings at one time motivates the team to set up 2 sampling stations to collect the samples as quickly as possible (Daniel Costello); Sampling at sunset (Daniel Costello); Leatherback hatchlings ready to emerge (Christina MacMillan).



*Passive Acoustics Testing Cruise, San Diego, July 16* - The marine mammal acoustics group will conduct a gear-test cruise on the fishing vessel *Horizon* out of H&M landing (funded with co-op program funds). New and re-built equipment will be field tested prior to their use on the upcoming California Current Cetacean & Ecosystem Assessment Survey (CalCurCEAS). Included in the tests will be the new towed tetrahedral arrays being developed jointly

with the PIFSC with ASTWG funding. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

*Hawksbill and green turtle research in El Salvador and Nicaragua, 7 -18 July* - Tomo Eguchi traveled to an ICAPO (Iniciativa Carey del Pacifico Oriental or Eastern Pacific Hawksbill Initiative; <http://www.hawksbill.org>) field site in Bahia Jiquilisco Biosphere Reserve, El Salvador last week. (The executive director of ICAPO is Alex Gaos; a doctoral graduate student at San Diego State University who works with the turtle groups at SWFSC). The research team based at La Pirraya conducts a wide variety of conservation and research projects on hawksbill turtles. Recently, they have expanded their capture-recapture effort to include green turtles. Eguchi met with local researchers, visited hawksbill hatcheries, participated in the fieldwork (captures of greens and hawksbills), and discussed the ongoing and future collaboration. During the visit, the first nesting by a hawksbill turtle was observed, the first nest in a hatchery was hatched (>85% hatching success), six green turtles were captured and



tagged (5 new captures), two hawksbill turtles were captured (1 new capture), and one dead hawksbill turtle (bycatch in longline) was retrieved and necropsied. Eguchi continues to the second field site in Nicaragua (Estero Padre Ramos) this coming week. Contact

[Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information. *Photos by Tomo Eguchi: Hawksbill sea turtle hatchling from Bahia Jiquilisco Biosphere Reserve, El Salvador; Hawksbill caught in a longline.*

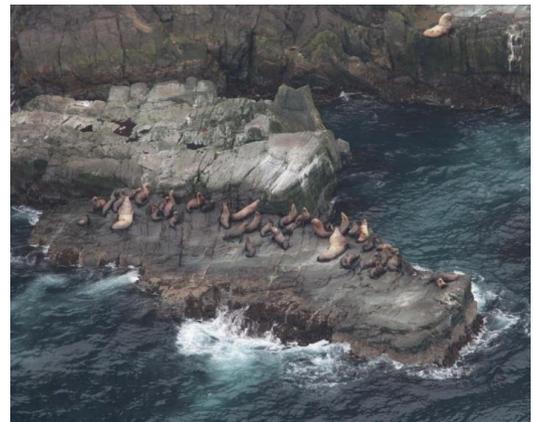


*Aleutian Islands Steller's Sea Lion Aerial Photogrammetry Survey, Aleutian Chain, AK, 22 June – mid July – Collaborative project with NOAA, AFSC, NMML. Chief Scientist is Lowell Fritz (NMML);*



biologists are Joshua Cutler (NMML) and Jim Gilpatrick (SWFSC, MMTD). NOAA, AOC crew includes Twin Otter pilots Lt. Dave Gothan and Lt. Dave Cowan; AOC aircraft mechanic is Robert Miletec. The flight team relocated from Dutch Harbor to Adak Island on 30 June in order to survey haul-out and pupping sites along the central and western Aleutians. The crew transited towards Cold Bay on 10 July in order to continue survey of the central Aleutians. To date, 219 sea lion sites have been surveyed; this includes 21 sites in the far western Aleutians photographed via a hexacopter piloted by Katie Sweeney and Van Helker from NMML. The hexacopter team has

been stationed aboard the USFWS R/V *Tiglax*. The Steller's aerial photogrammetric survey will conclude this weekend as the NOAA Twin Otter and crew return to Anchorage. *Photos: Steller's Sea Lion Survey Team in Adak, AK; Steller's Sea Lions at Adak Island, AK; R/V Tiglax underway in the western Aleutian Islands.*



*Week of 7 July 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general).



The team has now observed over 45 nests (though nesting females have slowed to a rate of 1 per night during the past week) and collected 1759 samples (520 in the last 2 days alone). This past

week, an emerging nest for the USFWS Education Program to observe was identified each evening (Tuesday through Saturday). Joel Schumacher, and volunteer Libby Rockefeller are new additions to the field team. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or



[Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov). Photos by Kelly Stewart: SWFSC's

Joel Schumacher and UCSD grad student (and Boyd Lyon Sea Turtle Fund Scholar) Liz Hetherington sample hatchlings; STAR teacher researcher Christina MacMillan stands beside a recent leatherback track; An unexpected hawksbill nest emergence allows for a size comparison between hawksbill and leatherback hatchlings.

*California Sea Lion Research, Southern California Bight, 7-13 July* - An aerial photographic survey of California sea lion rookeries throughout the Channel Islands will be conducted by Mark Lowry and Stephanie Nehasil. The survey will provide data to assess population abundance. Aircraft for the survey is provided by the Environmental Division of Naval Base Ventura County, US Navy. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

*Hawksbill and green turtle research in El Salvador and Nicaragua, 7-18 July* - Tomo Eguchi will visit field sites in Bahia de Jiquilisco, El Salvador and Estero Padre Ramos, Nicaragua as part of an ongoing collaboration between MMTD's Marine Turtle Ecology & Assessment Program and local researchers. The goal of this long-term research is to collect data for estimating vital rates of these species. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.

*Killer Whale Predation Research, Aleutian Islands, Alaska, 19 June – 3 July* – Field work has now been completed in a collaborative study of killer whale predation around the Aleutian Islands, Alaska. For the



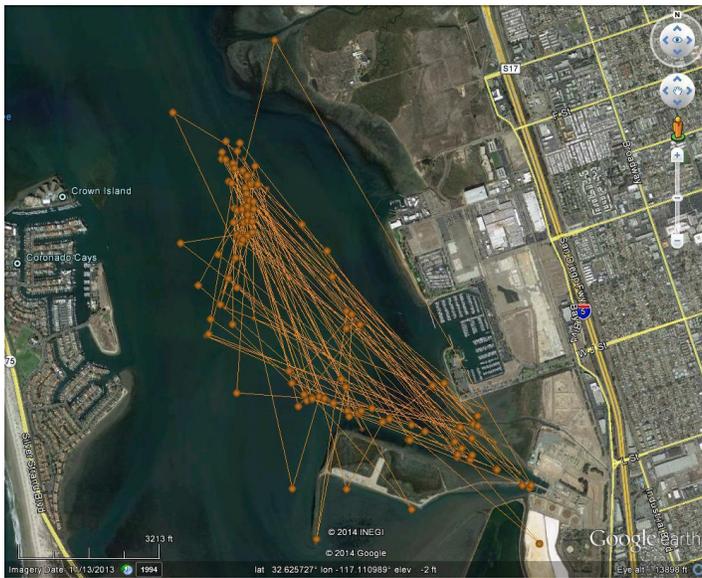
past two weeks John Durban (SWFSC/MMTD) and Paul Wade (NMML/AFSC) were hosted on a NOAA/AFSC Steller sea lion research cruise aboard the U.S. Fish and Wildlife Service vessel, *Tiglax*. Seven groups of fish-eating Resident-type killer whales were sighted during coastal surveys between Adak Island in the central Aleutians and Attu Island in the far western Aleutians. Two satellite LIMPET tags were deployed (one on an adult male, one on an adult female), and these tags are now transmitting movement and diving behavior. These data will be used alongside biopsy samples to help infer foraging habitat and prey

preferences. Resident killer whales were observed feeding on Atka mackerel during the survey,

highlighting the potential for competition with commercial fisheries and endangered Steller sea lions. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information. *Photos: A small satellite LIMPET tag deployed on the dorsal fin of an adult male Resident-type killer whale (small black tag near base of fin); A large adult male killer whale spyhopping off Alaid Island in the western Aleutians.*



*Aleutian Islands Steller's Sea Lion Aerial Photogrammetry Survey, Aleutian Chain, AK, 22 June – mid July* – Ongoing. Collaboration with AFSC (Chief Scientist Lowell Fritz).



*Green sea turtle ecological monitoring, San Diego Bay, 26 June and 1 July 2014* --- The Marine Turtle Ecology and Assessment Program Team (MTEAP) conducted two green sea turtle capture efforts in South San Diego Bay, with efforts based at the former South Bay Power Plant site. Based on telemetry data collected since the power plant closure, it appears that the turtles are continuing to use the areas adjacent to the former site as resting spots during the evening hours (see figure). Recent capture efforts have been conducted in the late afternoon/evening and have resulted in the capture of six turtles (three each outing) comprised of four Females and two juveniles. Two of the females were first captured in 1990 and have been studied extensively. Neither of the juveniles had been previously tagged, indicating that recruitment into the population continues. Two turtles were

equipped with GPS-linked satellite tags for an ongoing habitat use study. Tissue samples were collected for hormone, stable isotope, and genetic analyses. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) or [Robin.LeRoux@noaa.gov](mailto:Robin.LeRoux@noaa.gov) for more information. *GPS track of a green turtle captured in San Diego Bay on 06/26/2014 indicating an affinity to the former power plant site, which occurs in the evening hours (bottom right side of the figure).*

*Week of 30 June 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually



unknown for marine turtles in general). The weather has been very dry this nesting season and that continued last week. With little rain, we have been having high numbers of hatchlings and have now collected 948 samples from 25 nests. The number of nesting females

continues to be high as well, with an average of 3 females nesting



nightly. This past week we had an opportunity to see green turtle hatchlings (photo), as there was an unexpected hatchout of an early-season green turtle nest. Planning is underway for student projects - Claire Gonzales will be working on her senior thesis on female nest site selection. Our two STAR Teacher Researchers will begin their research as well. Daniel Costello will study predator abundance and effects, while Christina MacMillan will study the movement of hatchlings toward the sea. This coming Monday, Joel Schumacher joins the field team. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).



*Photos by Robin LeRoux: A green turtle hatchling; Kelly Stewart with STAR teacher researchers Daniel Costello and Christina MacMillan; Claire Gonzales of Duke University prepares to mark a hatching nest.*

*Aleutian Islands Steller's Sea Lion Aerial Photogrammetry Survey, Aleutian Chain, AK, 22 June – mid July* – This survey, led by AFSC (Chief Scientist Lowell Fritz) and with field scientists from AFSC and MMTD-SWFSC (Joshua Cutler and Jim Glipatrick, respectively), began in Dutch Harbor, Unalaska, Alaska. A NOAA Twin Otter (Pilots Lt Dave Gothan and Lt Dave Cowen, and mechanic Rob Miletic) is carrying a digital camera system designed by Don LeRoi (SWFSC contractor) and Wayne Perryman (SWFSC) to document the abundance and morphometrics of sea lions along the central and western Aleutian Islands. Despite 4 days of fog and rain and an aviation fuel shortage here in Dutch Harbor, approximately 110 Steller's Sea Lion haul out and pupping sites have been surveyed to date with total flight time 17 hours. The survey team will relocate to Adak Island as soon as weather conditions improve, to complete the survey.

*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 26 June. Three groups totaling 25 dolphins were encountered and photo-identified. For more details on this project please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov).

*Killer Whale Predation Research, Aleutian Islands, Alaska, 19 June – 3 July* – Ongoing, in collaboration with AFSC. Project goals are to describe transient killer whale foraging behavior by deploying depth-recording satellite transmitter tags, and specifically test the hypothesis that, in addition to marine mammals, they forage on squid using deep-foraging dives. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

#### *Week of 23 June 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general). Sampling began on June 17<sup>th</sup> with Kelly Stewart, local volunteers and Duke intern Claire Gonzales, volunteer Lesley Thorne and Robin LeRoux. The team observed 12 nests and collected samples from 308 hatchlings. Nesting was slow to start this year (beginning in March),



but got very busy in late May and early June (there were 8

leatherbacks nesting on June 13<sup>th</sup>). Team members joining next week include Suzanne Roden, UCSD graduate student Liz Hetherington, and STAR Research Teachers Daniel Costello and Christina MacMillan. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).



*Photos: Leatherback hatchlings emerge from a nest at Sandy Point National Wildlife Refuge, St. Croix, USVI; Robin LeRoux conducts genetic sampling on leatherback hatchlings.*

*Killer Whale Predation Research, Aleutian Islands, Alaska, 19 June – 3 July* – Ongoing, in collaboration with AFSC. Project goals are to describe transient killer whale foraging behavior by deploying depth-recording satellite transmitter tags, and specifically test the hypothesis that, in addition to marine mammals, they forage on squid using deep-foraging dives. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

### *Week of 16 June 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – The goal of this multi-year project is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general). For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

*Green Sea Turtle Ecological Monitoring, San Diego Bay, 10 June 2014* --- The Marine Turtle Ecology and Assessment Program Team (MTEAP) conducted green sea turtle capture efforts in South San Diego Bay, with efforts based at the former South Bay Power Plant site. The team was assisted by several SWFSC interns along with collaborators from Navy and San Diego State University. Four turtles were captured, including one juvenile (42kg) one adult female (82 kg), and two adult males (126 kg and 147 kg). The 126 kg male was first caught by SWFSC researchers in 1991 and has been captured eight times in San Diego Bay over the last 23 years. He weighed 18 kg at first capture, and since then his straight carapace length (SCL) increased from 54.4 cm to 96.7 cm. The 147 kg male has also been caught eight times in San Diego Bay. His first capture was in 1999, at which time his SCL was 101.0. He’s grown only slightly over the last 15years, now measuring 102.6 cm SCL. Two turtles (1 adult male + the juvenile) were equipped with GPS-linked satellite tags for an ongoing habitat use study. Tissue samples were collected for hormone, stable isotope, and genetic analyses. Previous studies conducted by SWFSC researchers during the Power Plant days had revealed that many green turtles used waters near the Plant due to the warm water that was discharged. However, with the power plant now closed for nearly two years, it appears that at least some turtles maintain affinity to this area despite the cooler water temperatures. Current GPS tracking efforts will learn the extent to which turtles use these areas. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.

*Killer Whale Predation Research, Aleutian Islands, Alaska, 19 June – 3 July* - This week field work will begin on a project "Investigating the foraging and diving behavior of transient killer whales to determine predation on Steller sea lions". This collaboration between the University of Alaska (Russ Andrews), NOAA/AFSC (Paul Wade) and MMTD (John Durban) with funding from the University of Alaska's Pollock Conservation Cooperative Research Center will be conducted aboard the U.S. Fish and Wildlife Service vessel, Tiġlax, starting and ending at Adak Island and extending to the western end of the Aleutian Islands. Project goals are to describe transient killer whale foraging behavior by deploying depth-recording satellite transmitter tags, and specifically test the hypothesis that, in addition to marine mammals, they forage on squid using deep-foraging dives. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

### *Week of 9 June 2014*

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, June-July* – Next week begins the 2014 season of this multi-year project, the goal of which is to collect tiny skin samples from leatherback turtle hatchlings in order to genetically “tag” them. This information will provide insight into basic demographic parameters (which remain virtually unknown for marine turtles in general). Nests are beginning to hatch and Kelly Stewart departs for the field on June 11<sup>th</sup> to lead the research effort. Over the next 8 weeks staff from SWFSC will conduct this research. A total of 12 volunteers will assist, along with UCSD Ecology graduate student Liz Hetherington, Duke undergraduate Claire Gonzales, and two STAR teacher research interns, Daniel Costello and Christina MacMillan. For more information, please contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov).

### *Week of 2 June 2014*

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – The 2014 season ended last Friday, 30 May. Last week’s total calf count was 6, with none recorded on the last day of the survey season. The total count (before final data edits) is 436 calves, the 4th highest count total in the time series (and previous seasons with higher counts were made during 6 days/ week effort, instead of the current 5 days/week due

to funding limitations). Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

### **Week of 26 May 2014**

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – The total cow/calf count last week was 31, with only one on Thursday and none on Friday. This coming week will be the last of the 2014 survey. The total count for the season is 430 calves, one of the highest estimates in the 21 year time series. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Marine Mammal Shakedown Survey, NOAA Research Vessel REUBEN LASKER, 18-22 May* - Leg 4 of NOAA Ship *Lasker* Shakedown trials were designed to ensure that the ship was ready for MMTD projects. The primary objective was to conduct a trial cetacean assessment and ecosystem survey mission using standard operating procedures. Overall, the consensus was that the ship will work very well for marine mammal ecosystem surveys with minor adjustments. The main systems tested included passive acoustics, DASBR buoys, marine mammal sightings, bow biopsy, vertical photography, small boat operations, and computer communications. The ship maneuvered well through the all operations. The MMTD team included Robert Pitman, James Cotton, Shannon Rankin, Robert Holland, Jennifer Keating, Emily Griffiths Michelle Robbins, and Annette Henry. For further information, please contact [Annette.Henry@noaa.gov](mailto:Annette.Henry@noaa.gov).

### **Week of 19 May 2014**

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – This week's total cow-calf pair count was 64, bringing our seasonal total to 399. This year is shaping up to be a big one in terms of calf production. Stay tuned. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information

### **Week of 12 May 2014**

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – Although the team lost 11 hrs of watch effort to high winds and fog last week, 82 cow-calf pairs were recorded, the second highest weekly total of the season. The total count for 2014 is now 334 calves (the 5th highest count by this date in the 21 year time series). Details of this survey, the time series, and this year's calf counts can be found at



<http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Photo – A gray whale calf breaches as it migrates north past Piedras Blancas Lighthouse.*

### **Week of 05 May 2014**

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – Last week saw a full 5 days of effort (60 hours) and a total of 106 cow/calf pairs and 2 adults recorded. The high count

occurred Monday, with 25, and the low Friday, with 17 cow/calf pairs, respectively. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Behavioral Response of Cetaceans to Navy Sonar, U.S. Navy's Atlantic Test and Evaluation Center (AUTEK), Bahamas, 28 April – May – Ongoing.* Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

### **Week of 28 April 2014**

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May –* A total of 71 cow/calf pairs, 7 adults and 1 juvenile were recorded this week during 51.5 hours of effort. (Fog, wind, and rain shut down observations for parts of Monday, Tuesday, and Friday, respectively.) The team will host a special visitor on May 1<sup>st</sup>. Kirsten Erickson, an attorney with NOAA General Counsel, WCRO, will visit to gain a first-hand understanding of our methods for shore-based gray whale assessments. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Behavioral Response of Cetaceans to Navy Sonar, U.S. Navy's Atlantic Test and Evaluation Center (AUTEK), Bahamas, 28 April – May -* This week MMTD (John Durban) began field work to deploy satellite tags on cetaceans, specifically beaked whales, in advance of scheduled fleet-readiness training. This continues a collaboration (ongoing since 2009) between MMTD/SWFSC, the Bahamas Marine Mammal Research Organisation and the Naval Undersea Warfare Center, to assess movement and diving responses of cetaceans to sonar exposure and inform models of the population consequences of acoustic disturbance (PCAD). Seven tags have been deployed on four species over the first three days: Cuvier's beaked whales ( $n=1$ ), short-finned pilot whales ( $n=3$ ), melon-headed whales ( $n=2$ ) and sperm whales ( $n=1$ ). Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

### **Week of 21 April 2014**

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May –* Last week's non-whale sighting of the week was a bobcat on Monday, followed by lots of whales: 57 cow-calf pairs, 23 adults, and 4 juveniles in 54.5 hrs of effort. The biggest day was Friday, with 20 cow-calf pairs. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Surveys of Leatherback Turtles, South China and Sulu seas, 22 April - 9 May -* Scott Benson will participate in an aerial survey of leatherback turtles, cetaceans, and dugongs as a guest of Marine Wildlife Watch of the Philippines. The project aims to determine spatial and temporal patterns of endangered western Pacific leatherback turtles off the coasts of Palawan, Balabac, and Busuanga islands, address gaps in our knowledge of leatherback foraging ecology in neritic tropical waters, and strengthen transpacific research collaborations. The region was identified as a high-use foraging region for leatherbacks that nest during the boreal summer in Papua Barat, Indonesia from telemetry studies conducted during 2003-2007. Leatherbacks of this population also utilize waters off the US west coast as a high-use foraging area. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.

*San Diego Coastal Bottlenose Dolphin Research –* As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 16 April. Four groups totaling 20 dolphins were encountered and photo-identified. In addition, four gray whale groups were observed, including three mother-calf pairs. For more details on this project please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov).

*Pinniped Ecological Research, Channel Islands, Southern California Bight, Quarterly* - Mark Lowry and Stephanie Nehasil traveled to San Clemente Island 18-21 April to collect California sea lion scat samples for diet analysis and to count sea lions and elephant seals at and near Mail Point.

#### ***Week of 14 April 2014***

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – Fog cost the team 17 hours of effort last week. During the remaining hours of survey a total of 77 gray whales were recorded migrating northbound. This included 8 cow-calf pairs, bringing the 2014 season's total to 18 pairs to date. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

#### ***Week of 7 April 2014***

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – Rain cost the team 14 hours of effort last week but the first cow-calf pairs of gray whales for the 2014 season were counted (10). Additionally, 170 adults and 20 juveniles were recorded. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Pinniped Ecological Research, Southern California Bight, Quarterly* - Mark Lowry and Nicky Beaulieu conducted pinniped field studies at San Nicolas Island during 1-3 April 2014. While at the island they collected 100 California sea lion scat samples for diet studies.

#### ***Week of 31 March 2014***

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – Monday, 24 March, begins the 21<sup>st</sup> consecutive season of this shore-based survey, which counts gray whale cows and calves as they migrate north, from breeding/wintering sites along the west coast of Baja California, Mexico, to feeding/summering sites in the Pacific northwest, Canada, and Alaska. The northward migration begins about mid-February and is segregated according to age, sex and reproductive condition. Piedras Blancas, a point of land just north of San Simeon, California and just south of the Big Sur coast, is an ideal site for this survey because animals generally pass within 200 m of the point and often stop to nurse their young in the lee of the rocky point. Counts of northbound cows and calves have revealed surprising variability in calf production. The number of calves born each year is related to environmental conditions in the Arctic that may limit prey populations and/or the availability of prey to reproductive females. We have hypothesized that the timing of the melt of sea ice in the Arctic may control access to primary feeding grounds for newly pregnant females and thus impact the probability that existing pregnancies will be carried to term. This project, along with the SWFSC survey of southbound gray whales and analyses of ice distribution information from the Arctic, enables us to study the link between reproduction and interannual climate variability. The initial 2014 team consists of Morgan Lynn, Kelly Schill, Jim Gilpatrick, and Wayne Perryman. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Cetacean Passive Acoustics Field Trials, Southern California Bight, 26 & 28 March* - The cetacean acoustics group will test newly-developed towed array hardware designs during sea trials on the F/V *Pacific Voyager* (Seaforth Landing) this week. This tetrahedral array design will allow for improved localization (cooperative project with PIFSC funded by Advanced Science & Technology Working Group, ASTWG) and precision of localization of this and other hydrophone array designs developed in earlier years. Localization studies use an autonomous playback device developed by Aaron Thode (SIO). This highly collaborative sea trial was funded by NOAA's funds for collaborative work with the Sportsfishing Association of California. J. Barlow, S. Rankin, J. Keating, E. Griffiths, E. Keen, A. Van Cise, E. Jacobson, and Y. Barkley (PIFSC) will participate.

### ***Week of 24 March 2014***

*Gray Whale Calf Production Survey, Piedras Blancas Lighthouse, California, Mar – May* – Monday, 24 March, begins the 21<sup>st</sup> consecutive season of this shore-based survey, which counts gray whale cows and calves as they migrate north, from breeding/wintering sites along the west coast of Baja California, Mexico, to feeding/summering sites in the Pacific northwest, Canada, and Alaska. The northward migration begins about mid-February and is segregated according to age, sex and reproductive condition. Piedras Blancas, a point of land just north of San Simeon, California and just south of the Big Sur coast, is an ideal site for this survey because animals generally pass within 200 m of the point and often stop to nurse their young in the lee of the rocky point. Counts of northbound cows and calves have revealed surprising variability in calf production. The number of calves born each year is related to environmental conditions in the Arctic that may limit prey populations and/or the availability of prey to reproductive females. We have hypothesized that the timing of the melt of sea ice in the Arctic may control access to primary feeding grounds for newly pregnant females and thus impact the probability that existing pregnancies will be carried to term. This project, along with the SWFSC survey of southbound gray whales and analyses of ice distribution information from the Arctic, enables us to study the link between reproduction and interannual climate variability. The initial 2014 team consists of Morgan Lynn, Kelly Schill, Jim Gilpatrick, and Wayne Perryman. Details of this survey, the time series, and this year's calf counts can be found at <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

*Cetacean Passive Acoustics Field Trials, Southern California Bight, 26 & 28 March* - The cetacean acoustics group will test newly-developed towed array hardware designs during sea trials on the F/V *Pacific Voyager* (Seaforth Landing) this week. This tetrahedral array design will allow for improved localization (cooperative project with PIFSC funded by Advanced Science & Technology Working Group, ASTWG) and precision of localization of this and other hydrophone array designs developed in earlier years. Localization studies use an autonomous playback device developed by Aaron Thode (SIO). This highly collaborative sea trial was funded by NOAA's funds for collaborative work with the Sportsfishing Association of California. J. Barlow, S. Rankin, J. Keating, E. Griffiths, E. Keen, A. Van Cise, E. Jacobson, and Y. Barkley (PIFSC) will participate.

### ***Week of 17 March 2014***

*Green sea turtle ecological research, San Diego Bay, 13 March 2014* — The SWFSC sea turtle research team conducted in-water capture efforts for the first time in 2014. In the post-power plant era, our research season has shifted to summer months, but due to the warm weather over the last few weeks, surface water temperatures in the Bay increased to 19°C in the southern most portion of the bay where turtles reside. The team was successful in capturing three turtles; an adult male, and two adult females. This marks the first time in nearly 3 years that three turtles were captured in a single day. Each weighed more than 350 lbs, with the largest coming in at 375 lbs. Turtle-borne video cameras were deployed on two turtles and a GPS satellite tag was attached to one turtle. For more information contact project PI [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov).

### ***Week of 3 March 2014***

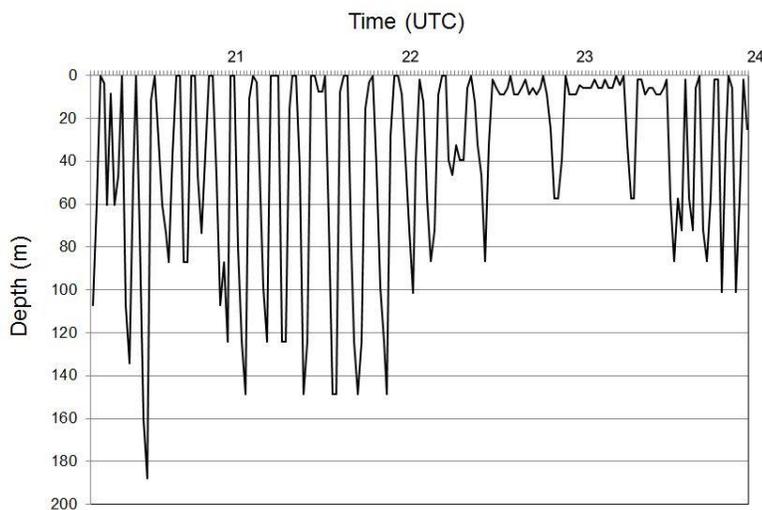
*San Diego Coastal Bottlenose Dolphin Research, monthly* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 25 February. Five groups totaling nearly 50 dolphins were encountered and over 1000 digital photographs were collected. In addition, one group of white-sided dolphins, one group of common dolphins and several groups of gray whales were observed. For more details on this project please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov).

*Green Turtle Ecological Research, San Gabriel River, Orange County, CA, 5 March* - SWFSC marine turtle researchers, biologists from the NMFS West Coast Regional Office, and California State University Long Beach conducted ongoing research focused on green sea turtles at this industrialized site. So far in 2014, the team has captured two juvenile green turtles here. Contact PIs [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov), [Robin.LeRoux@noaa.gov](mailto:Robin.LeRoux@noaa.gov) or [Jeff.Seminoff@noaa.gov](mailto:Jeff.Seminoff@noaa.gov) for more information.

*Marine Turtle Nesting Beach and Bycatch Monitoring, Guinea Bissau, Sierra Leone & Liberia, West Africa, 5 - 30 March* - Manjula Tiwari is traveling to Guinea Bissau to evaluate the nesting beach project managed by the Institute of Biodiversity and Protected Areas of Guinea Bissau. In Sierra Leone, she will visit the expanding nesting beach monitoring project, conduct beach surveys, meet with local authorities, and review the bycatch data collection in the artisanal fisheries; this project is a collaboration with colleagues at the Reptile and Amphibian Program of Sierra Leone. In Liberia, she will meet with colleagues at Save my Future (SAMFU) and Sea Turtle Watch Program and visit the beach projects to evaluate the success of the nesting beach and bycatch monitoring programs, which are carried out in collaboration with the coastal communities. Contact [Manjula.Tiwari@noaa.gov](mailto:Manjula.Tiwari@noaa.gov) for more information.

### ***Week of 17 February 2014***

*Antarctic Killer Whale Ecological Research, Antarctic Peninsula* - John Durban and Bob Pitman are now heading north across the Southern Ocean, having completed their final expedition of the season to the Antarctic Peninsula region onboard the National Geographic Explorer. Photo-identification data were collected from three groups of killer whales (13 for the season) and a depth-recording satellite tag was deployed on an Antarctic Type B killer whale (7 in total). A satellite tag was also deployed on an Antarctic minke whale (2 for the season), as part of a



collaboration with the Australian Antarctic Division to fill key data gaps on minke whale feeding ecology, migration and anti-predation behavior. Nine tags deployed this season continue to transmit, and will allow remote monitoring of movement and diving behavior over the coming months and hopefully into the start of the Austral winter. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Robert.Pitman@noaa.gov](mailto:Robert.Pitman@noaa.gov) for more information.

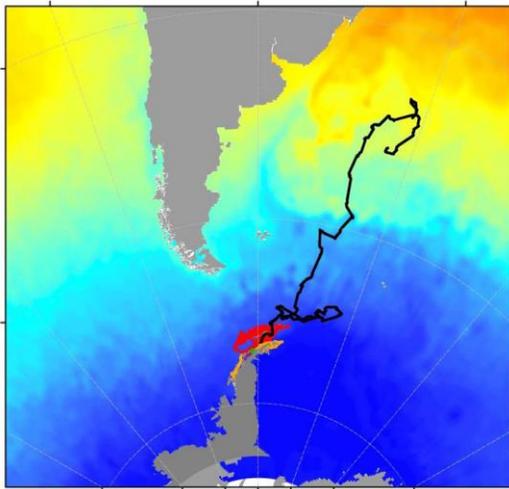
*Dive-depth time series from a satellite tag deployed on an adult Antarctic minke whale (data shown from the first deployment day).*

### ***Week of 10 February 2014***

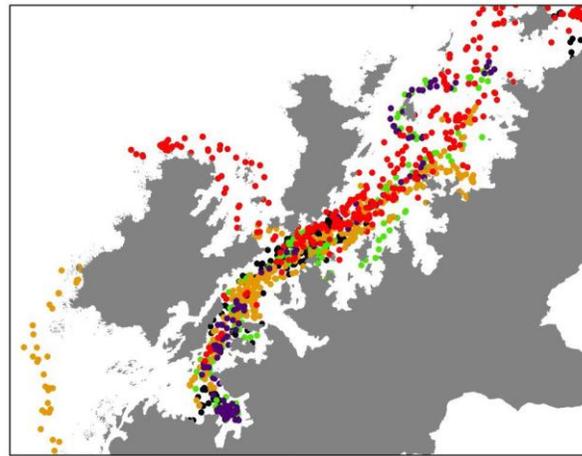
*Antarctic Killer Whale Ecological Research, Antarctic Peninsula* - John Durban and Bob Pitman are conducting research on the ecology of Antarctic killer whales onboard the expedition ship National Geographic Explorer, hosted by Lindblad Expeditions and National Geographic Society. The first of two expeditions to the Antarctic Peninsula area was completed this past week, providing excellent opportunities for data collection. Three groups of killer whales were sighted (all small form Antarctic Type B), enabling the deployment of three satellite

transmitter tags, in addition to the collection of photo-id data, photogrammetry measurements and biopsy samples. A total of 6 satellite tags have now been deployed on killer whales (plus one on an Antarctic minke whale) since December, and all continue to transmit to date. These tags are providing data on the movement and diving behavior of whales on a regional scale, and also

allowing



0 1,000 2,000 4,000 km  
inference about fine-scale habitat use.  
[John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or  
[Robert.Pitman@noaa.gov](mailto:Robert.Pitman@noaa.gov) for more information.



Contact

*Figures - Left: Wide scale movement tracks killer whales (Antarctic Type A and small form Type B) tagged with satellite transmitters since December 2013; all continue to transmit to date. Right: zoomed view showing a high concentration of location estimates for multiple whales (different colors) in the Gerlache Strait off the west side of the Antarctic Peninsula.*

of 6

### ***Week of 3 February 2014***

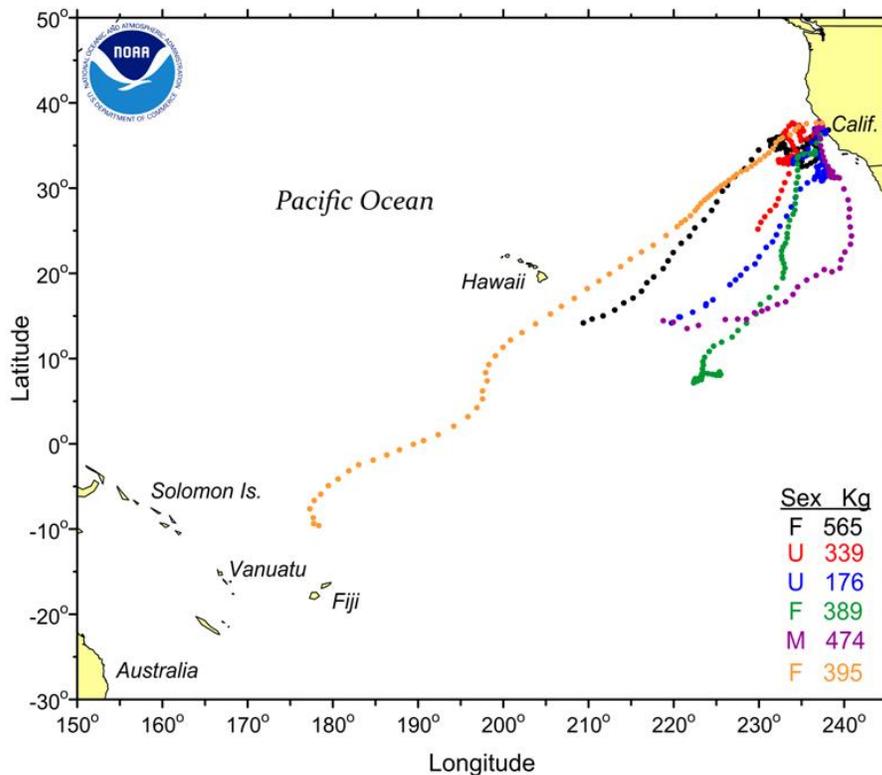
*Pinniped Abundance and Ecological Research, Southern California Bight* - Mark Lowry and Stephanie Nehasil traveled to San Clemente Island 28-30 January to collect California sea lion scat samples for diet analysis and to count sea lions and elephant seals at and near Mail Point. While at the island, Navy personnel stationed on the island assisted in re-stocking the research station at Mail Point with a supply of water with their ATV's. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for more information.

### ***Week of 27 January 2014***

*SWFSC leatherback capture and telemetry efforts* - During September 2013 the SWFSC Leatherback research team led by Scott Benson was successful at deploying 6 satellite tags on leatherback turtles ranging in weight from 176 to 565 kg (see map). As of 27 January 2014, 5 of these transmitters are still sending signals, showing the dispersal of leatherbacks from the central California coast to areas in the Central Pacific, with one turtle nearing Vanuatu in



what is likely a return trip to its western Pacific nesting beach. Contact PI [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.



**Week of 20 January 2014**

*Pinniped Ecological Research, Channel Islands, Southern California Bight* - Mark Lowry, Jeff Laake (AFSC), and Tomo Eguchi traveled to San Nicolas Island to catch and weigh California sea lion pups to determine if the 2013 Unusual Mortality Event (UME) was affecting the population in 2014 and to collect California sea lion scat samples for diet analysis. On 14 January, with the assistance of U.S. Navy biologist Bill Hoyer, they weighed 100 sea lion pups. On 15 January Mark, Jeff, and Tomo collected 100 sea lion scat samples. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) or [Jeff.Laake@noaa.gov](mailto:Jeff.Laake@noaa.gov) for more information.

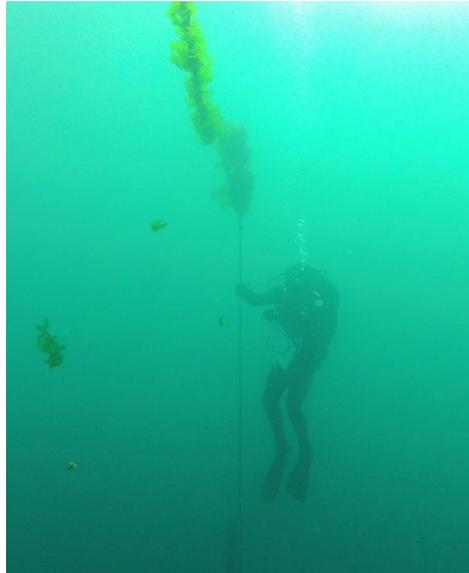


Photo: Jeff Laake (AFSC), Bill Hoyer (US Navy biologist) and Tomo Eguchi weigh a California sea lion pup at San Nicolas Island.

***Week of 13 January 2014***

*Harbor porpoise passive acoustic research, Monterey Bay, CA* - Eiren Jacobson (MMTD and SIO doctorate student) and Karin Forney successfully retrieved 11 acoustic click detectors (C-PODs) moored in Monterey Bay. Two moorings had had their surface floats removed and one was accidentally pulled up by a crab fisherman but all instruments were recovered in good condition. These instruments were deployed in August and continuously recorded harbor porpoise and other cetacean echolocation clicks for the duration of the deployment. Moss Landing Marine Laboratories provided invaluable small boat and diver support for this project, which is a collaborative effort funded by a grant from the California Institute for Energy and Environment. The study is a pilot project to develop design criteria for passive acoustic monitoring of harbor porpoise during construction and

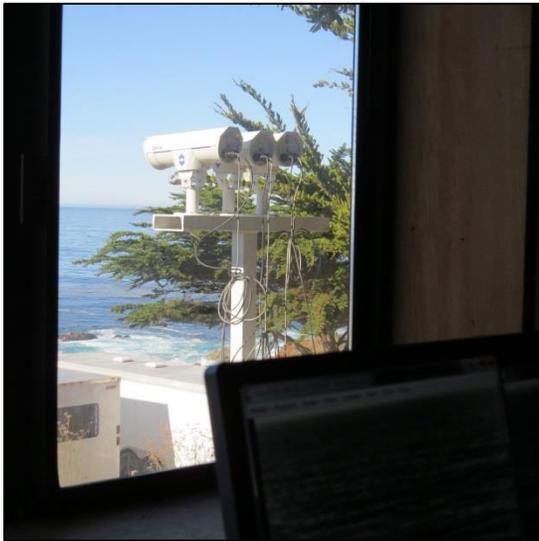
operation of marine renewable energy facilities in California. Eiren Jacobson will analyze the acoustic data in conjunction with aerial survey data collected in October. Contact [Karin.Forney@noaa.gov](mailto:Karin.Forney@noaa.gov) for additional information.



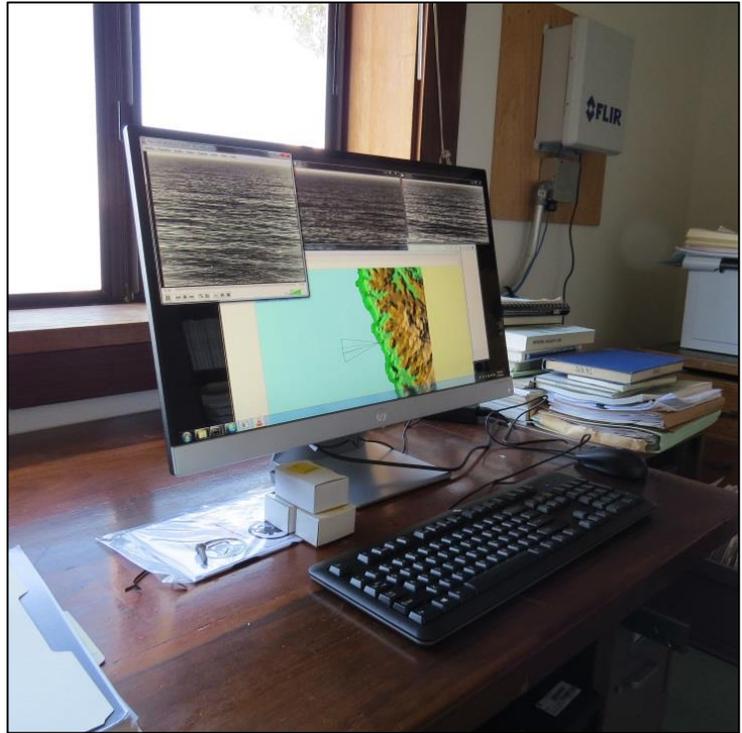
*Left: Karin and Eiren pull a heavily biofouled C-POD on board the R/V Sheila B. Right: MLML divers Scott Gabara and Jasmine Ruvalcaba successfully located a mooring that was missing its surface markers.*

***Week of 6 January 2014***

*Gray Whale Abundance Survey, Granite Canyon, CA, 6-10 January* –MMTD is responsible for monitoring abundance and trends of eastern North Pacific gray whales. The abundance time series, inherited from AFSC, dates to the late 1960s, has documented recovery of this species from commercial whaling to pre-exploitation levels, and has been the basis for removal of gray whales from the Endangered Species List. This week a team from MMTD (Wayne Perryman, Dave Weller, and Susan Chivers) will conduct a visual survey to



record migrating gray whales. This survey effort will be used to calibrate counts now generated from an automated system that uses thermal sensors to count migrating gray whales by detecting their blows, which are warmer than the ambient air. The automated system has been made possible through funding of a Phase II SBIR proposal and has the potential to greatly expand our ability to collect abundance data at dramatically reduced cost.



See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=9036> and contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.

### ***Week of 16 December 2013***

*Antarctic Killer Whale Ecology Research, Antarctic Peninsula, November – December 2013* – Another successful week, as John Durban and Holly Fearnbach are being hosted onboard the National Geographic Explorer in the coastal waters of the Antarctic Peninsula. Highlights included 3 sightings of killer whales, including Type A (specialist minke whale predators) and B2 (deep-divers, presumed to feed on fish). Photo-identifications documented re-sightings of the same groups seen in 2009 (B2s) and 2010 (As); providing key data for mark-recapture estimates of abundance. A satellite LIMPET tag was deployed on an adult female B2 (the 16th tag deployed on this type since 2009); data on ranging patterns will guide spatially-explicit abundance estimates. We also deployed a depth-recording satellite LIMPET tag on an Antarctic minke whale (see photo), as part of a collaboration with the Australian Antarctic Division. Movement and dive data from this tag, and others to be deployed later this season, will be used to address key objectives of the International Whaling Commission's Southern Ocean Research Partnership. These include investigating foraging behavior and habitat use by this species, describing anti-predator (killer whale) strategy, evaluating ranging patterns to assess exchange between coastal and offshore areas where Southern Ocean abundance surveys are conducted, and to investigate diving behavior and therefore quantify availability for visual abundance counts.



Follow tagged whales online at <http://swfsc.noaa.gov/MMTD-killerwhale-trackmap/> Contact [Robert.Pitman@noaa.gov](mailto:Robert.Pitman@noaa.gov) and [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for additional information.

*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 13 December. Five groups totaling nearly 115 dolphins were encountered and nearly 1100 digital photographs and 3 biopsy samples were collected. For more details on this project please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov).

Mark Lowry attended the CalCOFI conference that was held at SWFSC-La Jolla during 9-11 December and gave a talk on “Temporal and spatial differences in the diet of California sea lions at San Clemente Island and San Nicolas Island during 1981-2007.”

*MMTD-SIO Doctorate Student Wins Award* – Tara Whitty was awarded the J. Stephen Leatherwood Memorial Award at last week’s 20<sup>th</sup> Biennial Conference on the Biology of Marine Mammals for her presentation “Mapping conservation-scapes of small cetaceans & small-scale fisheries in southeast Asia”. The J. Stephen Leatherwood Memorial Award recognizes the most outstanding student presentation on marine mammals of South and Southeast Asia, with particular emphasis on conservation. Congratulations Tara!

### **Week of 9 December 2013**

*Antarctic Killer Whale Ecology Research, Antarctic Peninsula, November – December 2013* – This represents the sixth consecutive year of investigations into the ecology of Antarctic killer whales, with special emphasis on assessing the trophic impacts of killer whales as top predators within changing Antarctic marine systems. Hosted by Lindblad Expeditions and National Geographic, Robert Pitman and Aimee Lang (November), and John Durban and Holly Fearnbach (December) are onboard the expedition ship EXPLORER, conducting research on killer whales by collecting photographs (for individual identification and photogrammetric measurements) and



biopsy samples, and deploying satellite tags. Six groups of killer whales (two Types: A and small B) were sighted last week. In addition to collecting photographs and biopsy samples, satellite LIMPET tags were deployed on two individuals from two groups of Type A killer whales, which will enable the longer term monitoring of ranging patterns, habitat use and migration behavior, as well as facilitating relocation for follow-up studies later in the season. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) or [Robert.Pitman@noaa.gov](mailto:Robert.Pitman@noaa.gov) for more information. *Photo: A satellite LIMPET tag being deployed on the dorsal fin of a Type A killer whale near the Antarctic Peninsula. The tag was projected on a crossbow bolt*

*(orange in photo), which rebounded and left the small (49g) tag attached to the fin (black with protruding antenna).*

*20<sup>th</sup> Biennial Conference on the Biology of Marine Mammals, Dunedin, New Zealand, 7-13 December* – Twenty-five scientists from MMTD had presentations accepted for this biennial conference (21 talks and 4 posters). Fourteen (Jay Barlow, Jeff Moore, Karin Forney, Elizabeth Becker, Amy Van Cise, Eiren Jacobson, Susan Chivers, Kerri Danil, Camryn Allen, Tara Whitty, Barbara Taylor, Jeremy Rusin, Phil Morin, Tim Gerrodette) are in attendance, most on funding sources external to NMFS. Also, by video-conference, Sarah Mesnick remotely led the Cachalote Consortium (sperm whale) workshop. Participants hailed from South Africa, Australia, New Zealand, Spain, U.S., Canada, Norway, and the U.K. The videoconferencing was made possible by the IT expertise of Ravi Shiwmgangal and the workshop was funded by a generous gift from the Woods Hole Oceanographic Institution's Marine Mammal Center. See <http://www.marinemammalscience.org/> for more information on the conference.

*Sea Turtle Conservation* - The International Seafood Sustainability Foundations (ISSF) has become involved in supporting sea turtle conservation around the world as part of a holistic approach to address threats in partnership

with NGOs and in coordination with SWFSC experts. Peter Dutton provided technical advice. See the link below for more information.

<http://iss-foundation.org/2013/12/04/a-holistic-approach-to-sea-turtle-conservation/>

### ***Week of 2 December 2013***

NOAA Day at the Aquarium of the Pacific - [Kelly Goodwin](#), [Joel Schumacher](#) and [Jim Gilpatrick](#) of the MMTD represented the SWFSC in Long Beach at "NOAA Day at the Aquarium of the Pacific" on Saturday November 16th. The Aquarium reports that there were over 5500 visitors (mostly school kids). It was a terrific educational [outreach](#) event during which time Kelly, Joel, and Jim spoke about SWFSC research and gave out hundreds of color posters depicting ocean wildlife. Other NOAA offices present were the National Weather Service, NOAA Commissioned Officers Corps., NOAA SW Regional Office, NOAA Fisheries Law Enforcement, NOAA National Marine Sanctuaries, NOS and NOAA Sea Grant.

### ***Week of 25 November 2013***

#### **Field work:**

*Cetacean Acoustics Pilot Study, Southern California Bight, 9-25 November*- Last week researchers in the MMTD completed their deployment and retrieval of a series of drifting buoy recorders in the Catalina Basin. Aly Fleming was cruise leader on Leg 2 of this mission. Also participating were Emily Griffiths and Jeff Moore (from SWFSC) and Aaron Thode and two of his lab members (from SIO). During this leg, the buoys were retrieved, loaded with new batteries and memory cards, and re-deployed in a square 1x1 nmi array. Aaron's sound source was used to playback simulated dolphin and beaked whale sounds at varying distances from the array to test its ability to localize dolphins. Aaron was also testing some of his sound recording equipment. The success of this cruise was owed in large part to the skill and competence of the captain and crew of the charter F/V Outer Limits. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

#### **Press:**

*Graduate Student Research and Life History Collection featured in Radio Story* – Scripps Institution of Oceanography and MMTD Genetics lab graduate student Matt Leslie was the guest producer/reporter on a story about the Marine Mammal Life History Collection and his genetics research on spinner and spotted dolphin stock structure that depends on this collection. The story was part of the Encyclopedia of Life's "One Species at a Time" series. Matt conducted interviews with MMTD biologist Susan Chivers, Wayne Perryman and Bill Perrin regarding the tuna-dolphin issue, ongoing research in the area, and the uniqueness and importance of the Life History Collection. The story was funded in part by the National Science Foundation's IGERT Program grant to SIO. It is freely available for download at the Encyclopedia of Life website and the Public Radio Exchange at the following links: <http://education.eol.org/podcast/dolphins> and <http://www.prx.org/pieces/106546-untitled-november-20-2013>.

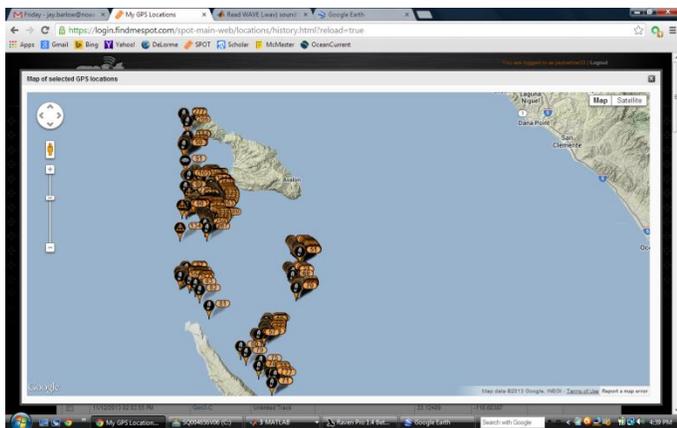
### ***Week of 18 November 2013***

#### **Field work:**

*Leatherback fine-scale satellite telemetry, Southern Mexico, 17-25 November* - Jeff Seminoff and Scott Benson will travel to the two largest leatherback nesting beaches in Mexico (Cahuitan and Tierra Colorado) to participate in a joint US-Mexico effort to study the fine-scale habitat use of endangered leatherback sea turtles. The team will deploy GPS satellite tags on inter-nesting leatherbacks to determine at what nearshore areas leatherbacks are most susceptible to entanglement in local artisanal fisheries gear. This effort will provide the groundwork for

development of nearshore protected areas adjacent to these last remaining leatherback nesting beaches. Seminoff and Benson's participation is supported by the Mexican Government and is another example of MMTD's close collaboration with Mexican Government scientists. Contact [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.

*Cetacean Acoustics Pilot Study, Southern California Bight, 9-25 November* - Last week researchers in the MMTD deployed a series of drifting buoy recorders in the Catalina Basin in a meso-scale study to estimate cetacean abundance using passive acoustic monitoring and to measure the ocean's soundscape. Buoys were deployed, retrieved, and re-deployed during the first week (see figure below). Additionally, new towed hydrophone arrays were tested to determine how well they could estimate the location of vocalizing cetaceans (using a sound projector at a known locations) and to measure the movement of an experimental in-line array at various tow speed. Leg 2 of the project departed on Sunday, Nov 16 aboard the F/V Outer Limits. The SWFSC crew consists of Aly Fleming (cruise leader), Jeff Moore (visual observer) and Emily Griffiths (acoustic tech). The goals are to retrieve buoy recorders and to re-deploy them in a square configuration for measuring detection distances. The time-of-arrival of sounds on different buoys can be used to estimate the location of vocalizing animals. Simulated sound sources (simulation dolphin whistles and clicks and beaked whale clicks) will be played through a device developed by Aaron Thode, research associate at Scripps. Aaron will also be participating in this study along with two people from his lab. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.



*UAS Testing and Training, Camp Roberts Range/Training and Development Facility, Central California, 11-14 November* - Teams from AFSC's NMML and SWFSC's Antarctic Ecosystem and Marine Mammal and Turtle Divisions completed a 4-day UAS flight training exercise at the US Army Maneuver Training Center, Camp Roberts, CA. Training included flight operations, simulated missions and long range flights, followed by evening debriefings. All teams performed very well and LTJG David Vejar from the Antarctic Ecosystem Program will be recommended for certification as a hexacopter pilot for Antarctic operations next week. In addition to pilot training, the team conducted noise level experiments and tested resolution for a new imaging system. Results of these tests will be available early in December. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



**Press:**

*MMTD's Antarctic Killer Whale Research featured in Jamejam News (published in Iran)*

گفت و گو با دکتر روبرت آل. پیتمن، پژوهشگر ارشد مرکز علوم شیلات جنوب غرب آمریکادرباره نهنگ‌های قاتل

## شیرجه‌های ۷۰۰ متری



**نظاره**  
 نهنگ‌های قاتل یا اورکاها بی‌امریاز فرم‌برداران باقدتار  
 قیاس‌ناهندستند. موجوداتی هوش، خویشتند چنان‌که  
 ویرفت‌که از نظر ظاهر، نسبت به دیگر گونه‌های آبی  
 را بیشتر می‌توان آنها را تشخیص داد. سطح فوقانی بدن  
 آنها سیاه و بخش‌های تحتانی سفید است. بیولوژیست‌ها  
 باور دارند که در مسیر تطویر تکاملی نهنگ‌ها، از ماهی  
 جایی پخته‌است استراژی‌های شکارگر دست‌جمعی از جمله  
 رد و بدل کردن میانه‌های آبی در فواصل چند کیلومتری،  
 جهت‌یابی، همین سرعت مناسب، هم‌درست و در نهایت  
 ظاهر شدن از فضای تیره که شکار حتی احتمال آن را هم  
 نمی‌دهد، گویای یک طرح از پیش برآمده‌تری شده‌است.  
 هوش نا‌این موجودات و طول‌مفاویر آنها اسال‌هاست  
 نودبه پژوهشگران را به خود جلب کرده، دکتر روبرت آل.  
 پیتمن، اکولوژیست علوم دریایی برای تکمیل تحقیقات  
 خود روی اورکاها هر ساله حدود شش ماهت نامر را  
 در آب‌های سراسر جهان می‌گرداند. روزنامه جام‌جم در  
 گفت‌وگو با اختصاصی از دکتر روبرت آل. پیتمن، سرپرست  
 بخش پژوهشی لاک‌پشت‌ها و پستانداران دریایی سازمان  
 ملی آقیانوسی و جوی، خواسته تا مختصری از یافته‌ها  
 تجربیات و روش‌های تحقیق روی نهنگ‌های اورکا را با  
 خوانندگان در میان بگذارد.

فرانز هدری / جام‌جم

**نکته**

نهنگ‌های قاتل یا اورکاها به واسطه هوش، اندازه  
 قدرت و زیبایی شان یکی از منحصر به‌فردترین  
 موجوداتی هستند که در سیاره ما زیست  
 می‌کنند. من همیشه می‌گویم  
 که اگر در طول عمر خود  
 فقط شانس دیدن یک گونه  
 را دارید نهنگ‌قاتل را  
 در طبیعت و در محیط  
 زندگی خود آزاد  
 و رها ببینید

**Week of 12 November 2013**

**Field work:**

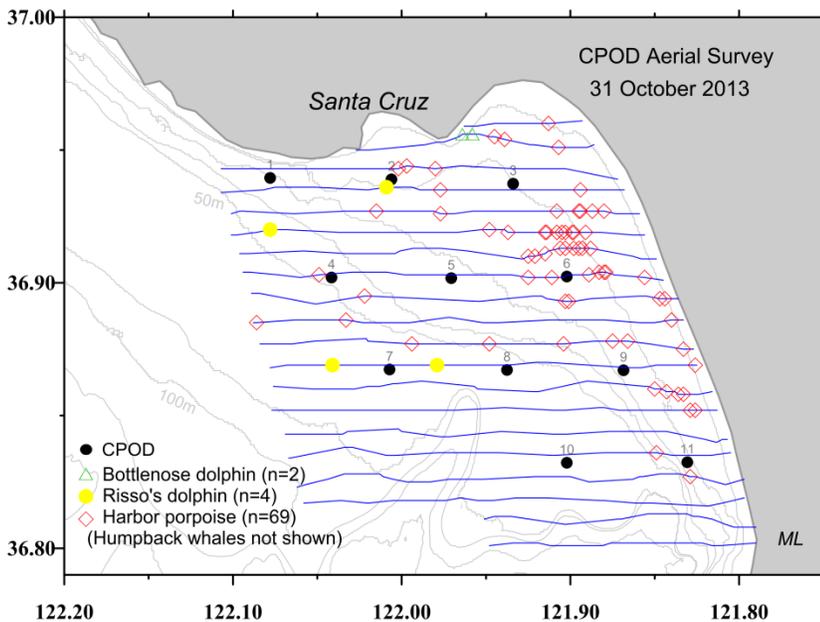
*Cetacean Acoustics Pilot Study, Southern California Bight, 9-14 November* – MMTD’s marine mammal acoustics program, aboard the F/V OUTER LIMITS, is deploying a grid of five drifting buoy recorders developed at the SWFSC, to record marine mammals and ambient noise in the Catalina Basin between Catalina, San Clemente and Santa Barbara Islands. They will also be testing the localization abilities of their new modular towed hydrophone arrays and will be testing their sonobuoy receiver equipment with re-usable sonobuoys. Participants include Shannon Rankin, Jay Barlow, Jennifer Keating, Eric Keen, Don Ljungblad, Jit Sarkar (UCSD-SIO) and Emily Griffiths (a new contractor working with the MMTD acoustics program). Funding sources include the S&T Acoustics Program and the Cooperative Research Program. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for additional information.

*UAS Testing and Training, Camp Roberts Rang/Training and Development Facility, Central California, 11-14 November* - The primary goal of this exercise is to provide operational training to new pilots in situations that simulate what they will encounter in the field. They will launch the aircraft, photograph a series of targets and return to the launch site. Flights will vary from very short missions (100-200 m from launch site) to long missions (1- 1.5 km from launch site). The secondary goal is to evaluate upgrades to the hexacopters and ground stations. The team has a new camera system for improved image resolution, and upgraded upgraded ground station and telemetry and video transmitters to improve data and image flow at distances > 1 km. The third goal is to conduct a noise survey to document the sound signature of the platform during normal sampling conditions. These data will be crucial to permit requests for ops over a wider range of protected species. The equipment includes two hexacopters (1 from SWFSC and 1 from NMML) and one quadrocopter (used exclusively for training missions). Participants are: Wayne Perryman (SWFSC, UAS Program Lead), Don LeRoi (Aerial Imaging Solutions, Chief Instructor), Jefferson Hinke (SWFSC Antarctic Program, Hexacopter Pilot), LTJG David Vejar (SWFSC Antarctic Program, Pilot Under Instruction), Kathryn Sweeney (AFSC, NMML, Pilot Under Instruction), LTJG Van Helker (AFSC, NMML, Pilot Under Instruction). Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for additional information.

**Week of 4 November 2013**

## Field work:

*Harbor Porpoise Passive Acoustic Research, Monterey Bay, CA, ongoing.* - Eiren Jacobson (SIO doctoral student), Karin Forney, Scott Benson, and Deasy Lontoh (Moss Landing Marine Laboratories student) successfully completed an aerial survey for harbor porpoise in Monterey Bay, CA on October 31st. Weather conditions were excellent, and the team recorded 69 harbor porpoise groups. Bottlenose dolphins, Risso's dolphins, and over 100 humpback whales were also observed. The survey is part of a collaborative SWFSC/MLML project funded under a grant from the California Institute for Energy and Environment. The goals of the project are to evaluate and develop design criteria for using passive acoustic methods to monitor trends, abundance, and potential impacts of marine renewable energy facilities (or other anthropogenic activities) on harbor porpoise off California. Eleven passive acoustic moorings (C-PODS) were previously deployed in this area during August 2013; they will remain in place until early January. The aerial survey data will be used to cross-calibrate visual and acoustic detections within the study area and to perform simulations on design alternatives, as part of Eiren's doctoral research at SIO. Contact [Karin.Forney@noaa.gov](mailto:Karin.Forney@noaa.gov) for additional details.



*Behavioral Response Studies of Deep-diving Cetaceans to Navy Sonar, Bahamas, 28 October – 8 November* - This week MMTD (John Durban) participated in field work to deploy satellite tags on cetaceans, specifically beaked whales, in advance of scheduled fleet-readiness training using sonar at the U.S. Navy's Atlantic Test and Evaluation Center (AUTC). One day presented winds calm enough for boat operations, and one satellite LIMPET tag was deployed on a Blainville's beaked whale (*Mesoplodon densirostris*). This tag will add to an ongoing/growing dataset being collected and analyzed in collaboration between MMTD/SWFSC, the Bahamas Marine Mammal Research Organisation and the Naval Undersea Warfare Center; to assess movement and diving responses of cetaceans to sonar exposure and inform models of the population consequences of acoustic disturbance (PCAD). Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

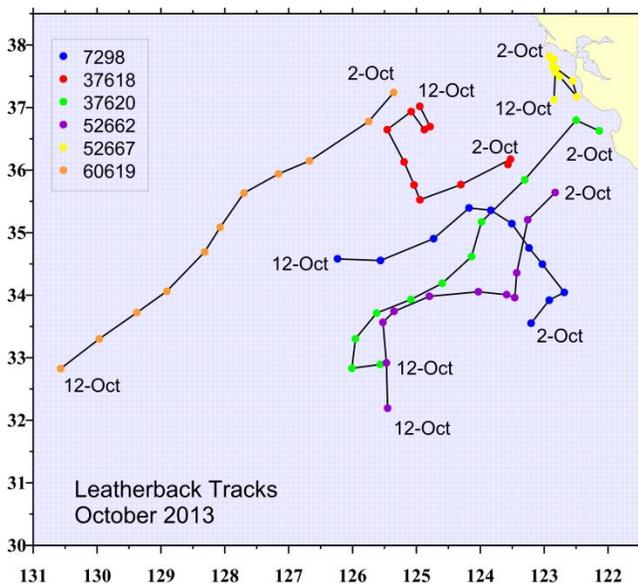
## Press:

*Radio Interview* – “America Weekend”, a radio talk show, featured a segment on the film “Blackfish” – focused on killer whales in captivity. Robert Pitman was a guest scientist on the program, and spoke about killer whale biology. The program aired Sunday, 3 November.

**Week of 28 October 2013**

## Field work:

*Central California Leatherback Turtle Research, Monterey Bay, CA, September – October 2013* – This project focuses on leatherback turtle foraging ecology in what has been identified as a foraging hotspot for this species. It uses small boats and aerial platforms to assess distribution, abundance, feeding behavior, and movement patterns. The 2013 effort concluded on 29 September and achieved tremendous success. Eight leatherbacks were captured and sampled, including the largest and smallest individuals ever captured in the history of the project (622 kg and 176 kg respectively). Four turtles were determined to be females, two were males, and two others were too small to determine sex identity by tail length. In addition to morphometric measurements, biological samples were obtained from seven turtles for ongoing health assessment and body condition studies. Data from ultrasound, clinical blood parameters, and fat biopsies will be used to model body condition in order to assess effects of body condition on contaminant cycling and the timing of migration. Multiple heart monitoring techniques were performed simultaneously to determine that doppler provides the most consistent and accurate method for heart rate monitoring in leatherbacks. Satellite-linked transmitters were attached to six animals prior to release. Most have moved in a southwest direction although one individual was remaining in central California nerctic waters as of 12 October. Aerial surveys revealed that leatherback density off the San Mateo coast remained high through the termination of sampling effort. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for additional information.



*Figures - Map of satellite tracked movements of 6 leatherbacks captured during the 2013 leatherback capture season; Leatherback on board the R/V Sheila B pictured with SWFSC and Moss Landing Marine Lab researchers.*

*Pinniped Abundance and Ecology Research, Channel Islands, Southern California Bight* - Mark Lowry and Libby Ahlers will census California sea lions and northern elephant seals, and collect California sea lion scat samples for diet studies at San Clemente Island 25-27 Oct 2013. Mark Lowry and Stephanie Nehasil will collect California sea lion scat samples for diet studies at San Nicolas Island 29-31 Oct 2013. Contact [Mark.Lowry@noaa.gov](mailto:Mark.Lowry@noaa.gov) for additional information.

*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted small boat surveys off San Diego on 30 September and 23 October. Two groups totaling 9 dolphins were encountered on 30 September and three groups totaling 42 dolphins were encountered on 23 October. Two groups of common dolphins, one group of offshore bottlenose dolphins and seven blue whales were also observed and photographed. One of the blue whales

observed had a highly unusual number of *Xenobalanus globicipitis* on it (see photo below). For more details on this project please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov).



*SCORE Naval Range Marine Mammal Monitoring* - This week (28 October to 4 November) Dave Weller will collaborate with SIO to conduct small boat work off San Clemente Island. The objectives of this research, initiated in 2008, are to use sighting, photo-identification, biopsy and acoustical sampling to monitor small cetaceans occurring in the Southern California Offshore Range (SCORE). The SCORE range is an area where Naval training exercises using mid-frequency active sonar are common. For more details on this project please contact [dave.weller@noaa.gov](mailto:dave.weller@noaa.gov).

### ***Week of 30 September 2013***

#### **Field work:**

*Central California Leatherback Turtle Research, Monterey Bay, CA, September – October 2013* – This project focuses on leatherback turtle foraging ecology in what has been identified as a foraging hotspot for this species. It uses small boats and aerial platforms to assess distribution, abundance, feeding behavior, and movement patterns. Last week (the final for the 2013 season) was a resounding success. The team captured five leatherbacks in the vicinity of Half Moon Bay. All were fitted with satellite tags, bringing the season's total to six (the first year since 2007 that multiple satellite transmitters have been deployed in a single season). Stay tuned next week for a season wrap-up and summary of accomplishments. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.

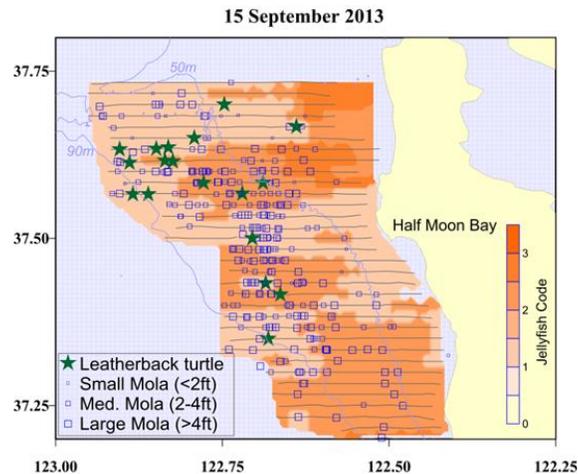


*Photos Above: Research team about Moss Landing Marine Lab's R/V Sheila B processing last turtle captured on 9/28/13; Male leatherback turtle with equipped with turtle-borne video camera and accelerometer.*

## Week of 23 September 2013

### Field work:

*Central California Leatherback Turtle Research, Monterey Bay, CA, September – October 2013* – This project focuses on leatherback turtle foraging ecology in what has been identified as a foraging hotspot for this species. It uses small boats and aerial platforms to assess distribution, abundance, feeding behavior, and movement patterns. Perfect conditions last week indeed revealed a foraging hotspot of leatherback turtles along the coast between Monterey Bay and San Francisco (see figure below). The team will be based in Half Moon Bay this week. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.



*Southern Resident Killer Whale (SRKW) Health and Condition Research, Puget Sound, WA, September* - In collaboration with the Center for Whale Research, MMTD scientists John Durban and Holly Fearnbach are quantifying body condition, size and growth of individual southern resident killer whales using aerial photographs and photogrammetric methods in order to assess the nutritional status of these Endangered whales. Funded by the NOAA Northwest Fisheries Science Center, this is a continuation of work first conducted in 2008, using a helicopter platform to obtain vertical images of whales from above in order to measure key morphometrics. The project ended last week with a total of nine hours of helicopter flights conducted over 5 days throughout the month of September. Guided by boat support, SRKWs were located on each flight, and a total of 6974 aerial images were obtained during encounters with whales primarily in U.S. waters to the west and south of San Juan Island, WA, and on one day off the southeast Vancouver Island, Canada. The Center for Whale Research vessel "Orca", a 6.5m Boston Whaler, was also photographed from the air on each day, to provide calibration photographs of an object of known size (and approximate whale size). Initial examination of the photographs is very encouraging, with many capturing images of individually-recognizable whales that appear to be measurable for body conditions (widths), size and growth (lengths), or both. Although yet to be confirmed by detailed analysis of individual identifications and formal measurements, we estimate to have measurable images of 70 distinct whales from a current population census of 81, representing more than 85% of the extant population. Most (45) of these whales were also represented in the 2008 aerial photogrammetry sample, despite losses (deaths) and additions (births) over the 5 years between funded efforts. Pending funding, analysis of these images will be conducted in 2014 to begin an examination of temporal changes in body condition of individual whales to assess changes of at-risk age/sex/reproductive classes relative to Chinook salmon abundance. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

*Southern California Behavioral Response Studies of Cetaceans to Simulated Navy Sonar, Southern California Bight, weeks of 9 and 16 September* - Jay Barlow and Jennifer Keating are on the Research Vessel TRUTH conducting passive acoustic monitoring focused on detection of beaked whales as part of a larger research project designed to tag cetaceans in order to quantify behavioral responses to simulated Navy Sonar. Weather has prevented work (and therefore, detection of beaked whales) offshore, so the team has been concentrating on Risso's dolphins and fin whales. The project has a brief "stand-down" day after a Risso's dolphin stranded on Manhattan Beach a day after their playback of simulated Navy sonar in nearby waters. The animal subsequently died, but a necropsy revealed that it was emaciated and had pancreatitis, so it is unlikely that the stranding was related to any playback activities. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.



Photos (above) - D-tag on a fin whale; fin whale surface lunge feeding; tagging of a Risso's dolphin.

*Aerial Photogrammetric Survey of Blue Whales, Southern California Bight, 18-20 September* - Eastern North Pacific (ENP) blue whales (*Balaenoptera musculus sp.*) migrate in summer from tropical and sub-tropical waters off Central America and Mexico to coastal feeding grounds mainly off of California. Additionally, some blue whales migrate farther north to feeding areas off of Oregon, Washington and British Columbia and ENP blues are occasionally found in the Gulf of Alaska. Jim Gilpatrick and Morgan Lynn conducted this survey to capture vertical aerial photographs to further describe the morphometrics of this unique population, and to quantify body condition and health/nutritional status through width measurements. Of particular interest is the nutritional status of nursing blue whale cows that are photographed with large calves at this time of the year. Blue whale photos are also reviewed for physical evidence of ship strikes and/or entanglement with commercial fishing gear. Individual blue whales can be identified in the images based on unique color mottling patterns, providing a data set for ongoing use in the future. During 12 hours of flight time approximately 45 blue whales were sighted (including two cow/calf pairs) and photographed during approximately 200 aerial photo-passes. ENP blue whales are normally found in large groups (of up to 30 individuals) feeding on krill swarms in the Santa Barbara Channel. This summer they were south of the Channel and loosely associated with the 100 fathom isobath and close to the Nine Mile Bank and the Coronado Islands west of San Diego as they fed on krill. Flocks of shearwaters, pelicans, western gulls, and terns, and minke whales were also associated with these krill patches. Sightings of blue whales continue to be made from the SWFSC (including this past weekend). Take a walk up to the big eyes and find a few this week. Contact [Jim.Gilpatrick@noaa.gov](mailto:Jim.Gilpatrick@noaa.gov) for more information.

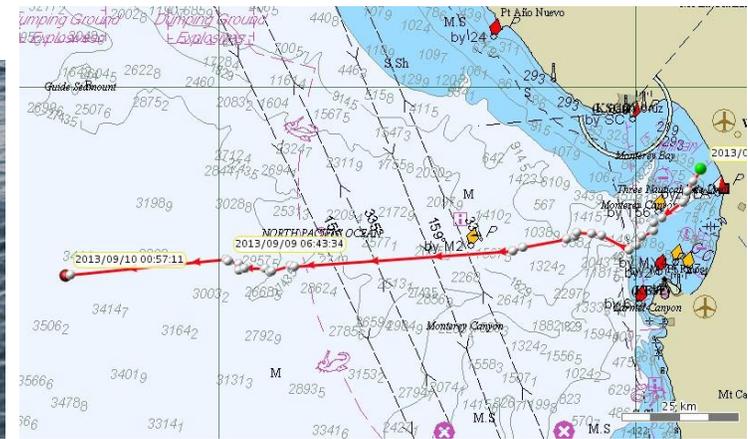


*Photos (above): A blue whale, with mouth wide open and gular pleats spread, feeds on krill near the surface; female-calf blue whale pair.*

### ***Week of 16 September 2013***

#### **Field work:**

*Central California Leatherback Turtle Research, Monterey Bay, CA, September – October 2013* – This project focuses on leatherback turtle foraging ecology in what has been identified as a foraging hotspot for this species. It uses small boats and aerial platforms to assess distribution, abundance, feeding behavior, and movement patterns. Thanks to a local pool of observers and experienced turtle-wranglers from Moss Landing Marine Laboratories, Scott Benson was able to take advantage of an early good-weather window last week (week 2 of the project) and begin aerial surveys and sampling before the primary SWFSC turtle team arrived on Sunday Sep 9. One leatherback was successfully captured and tagged with an Argos transmitter on Sep 7, and a TDR was attached to a second free-swimming turtle for an overnight deployment. The TDR from the second turtle was successfully recovered the next day, yielding a valuable day/night dive record. The captured turtle was carrying a PIT tag in the right shoulder that was applied at Papua Barat, Indonesia during June 2012. This is the first time in our project's 13-year history that we have sampled a turtle off California that was originally tagged at one of the western Pacific nesting beaches, representing a significant milestone that demonstrates the enhanced monitoring capacity of SWFSC's Indonesian colleagues. The tagged female turtle weighed 585 kg and was in excellent condition. Upon release, the turtle moved offshore. Sea nettles, the primary prey species of leatherbacks in neritic California waters, have been abundant this year, so she may have had her fill and begun her migration back to the western Pacific. Aerial surveys continue whenever weather conditions are favorable. Within Monterey Bay, humpback whales, ocean sunfish, and sea nettles remain abundant, but leatherback densities appear too low for effective in-water sampling efforts. By the end of the coming week, when sighting conditions are forecast to improve and the NOAA Twin Otter will have completed its scheduled 100-hr maintenance, the team expects to move operations north to the San Mateo coast, where a greater number of leatherbacks were seen on Sep 3. Jeff Seminoff departs 18 Sept to join the field team through 28 September. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.



*Southern Resident Killer Whale Health and Condition Research, Puget Sound, WA, September* - In collaboration with the Center for Whale Research, MMTD scientists John Durban and Holly Fearnbach are quantifying body condition, size and growth of individual southern resident killer whales using aerial photographs and photogrammetric methods in order to assess the nutritional status of these Endangered whales. Funded by the NOAA Northwest Fisheries Science Center, this is a continuation of work first conducted in 2008, using a helicopter platform to obtain vertical images of whales from above in order to measure key morphometrics. In total, 6973 aerial images have been obtained from 8 hours of helicopter flights over the past two weeks and measurable images from >70 individual whales, from a current population of 81, have been obtained. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

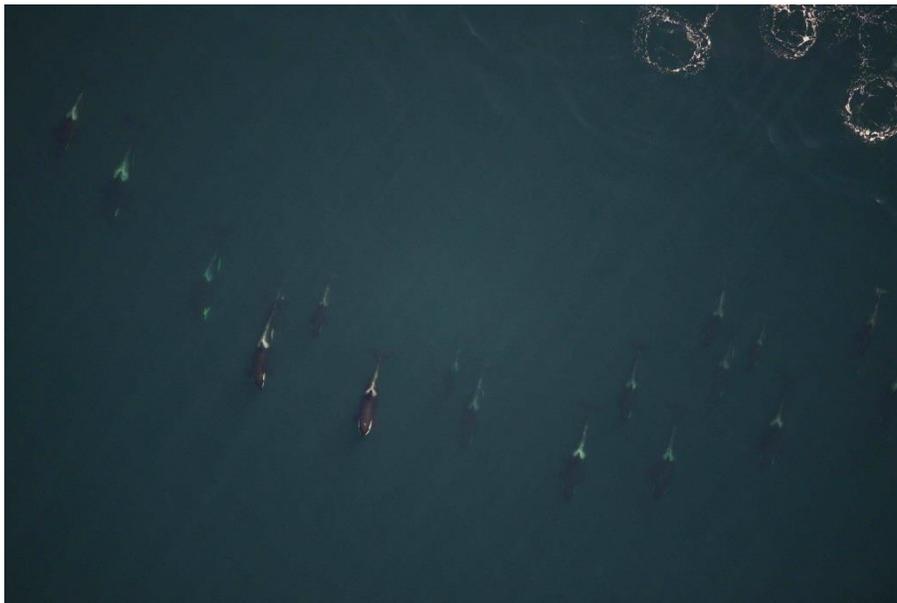


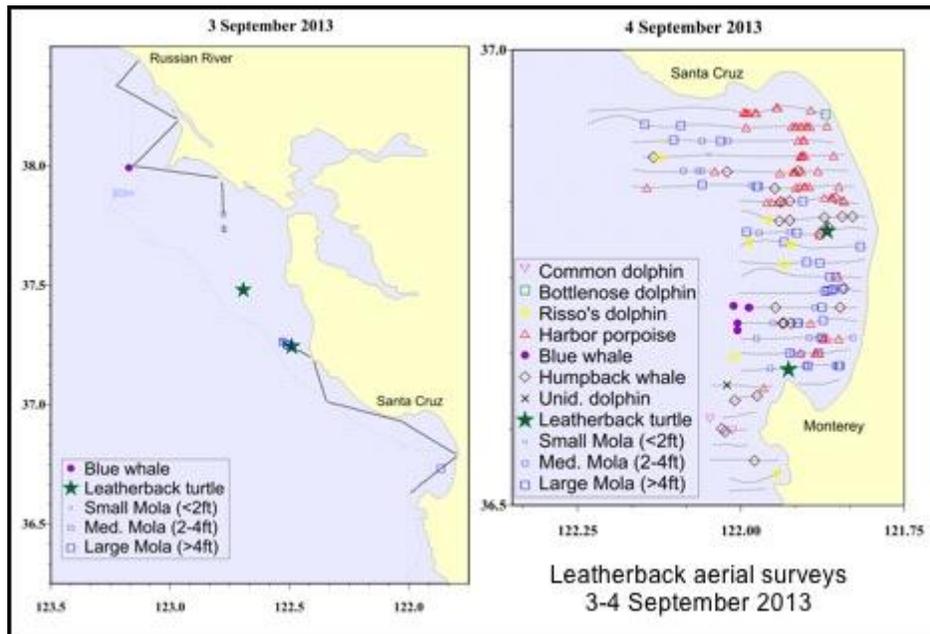
Photo Above (Holly Fearnbach): An impressive line-up of Southern Resident Killer Whales. Research approach authorized by National Marine Fisheries Permit # 15569.

*Southern California Behavioral Response Studies of Cetaceans to Simulated Navy Sonar, Southern California Bight, weeks of 9 and 16 September* - Jay Barlow and Jennifer Keating are on the Research Vessel TRUTH conducting passive acoustic monitoring as part of a larger research project designed to tag cetaceans in order to quantify behavioral responses to simulated Navy Sonar. To date there have been sightings of *Ziphius*, *Grampus*, and *Balaenoptera physalus*, and Controlled Exposure Experiments on the latter two species. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

## Week of 9 September 2013

### Field work:

*Central California Leatherback Turtle Research, Monterey Bay, CA, September – October 2013* – This project focuses on leatherback turtle foraging ecology in what has been identified as a foraging hotspot for this species. It uses small boats and aerial platforms to assess distribution, abundance, feeding behavior, and movement patterns. The 2013 season had a strong start last week with aerial survey operations aboard the NOAA Twin Otter N56RF, supported by pilots John Rossi and Michael Marino. SWFSC/MMTD staff Scott Benson and Karin Forney, along with contractors Elizabeth Becker and Melinda Nakagawa, completed two surveys on 3-4 September between Monterey Bay and the Russian River. Weather conditions were good to excellent, and five leatherback turtles were sighted, including two in Monterey Bay and three off the San Mateo County coast. Brown sea nettles, an important prey species for leatherback turtles, were very abundant. Many cetacean species were also recorded, including harbor porpoise, bottlenose dolphin, Risso's dolphin, common dolphin, blue whale, and humpback whale. Aerial surveys will continue throughout the month of September, as weather permits, in support of leatherback tagging efforts, foraging studies, and health assessments. Several additional SWFSC team members from La Jolla (Erin LaCasella, Dan Prospero, Joel Schumacher, Camryn Allen, Tomo Eguchi, Jun Okuyama, and Peter Dutton) will join the project this coming week for aerial surveys and leatherback turtle sampling. The leatherback aerial surveys will also provide data in support of a separate study conducted by Eiren Jacobson (SIO doctoral student) and Karin Forney to monitor harbor porpoise in Monterey Bay using passive acoustic moorings (CPODs). Visual harbor porpoise data from the fine-scale aerial surveys will be compared to the acoustic records collected on eleven CPODs deployed in late August 2013, to cross-calibrate the two monitoring techniques. Contact [Scott.Benson@noaa.gov](mailto:Scott.Benson@noaa.gov) for more information.



*Southern Resident Killer Whale Health and Condition Research, Puget Sound, WA, September* - In collaboration with the Center for Whale Research, MMTD scientists John Durban and Holly Fearnbach are quantifying body condition, size and growth of individual southern resident killer whales using aerial photographs and photogrammetric methods in order to assess the nutritional status of these Endangered whales. Funded by the NOAA Northwest Fisheries Science Center, this is a continuation of work first conducted in 2008, using a helicopter platform to obtain vertical images of whales from above in order to measure key morphometrics. Last week (the first of the 2013 season) was very successful; >3000 images during four hours of helicopter operations were collected. Guided by Center for Whale Research research boat, the team has been able to effectively spread coverage

across individual whales. At this writing, they estimate to have measurable photographs from approximately 40 different whales (pending analysis), representing about half of the population. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov)



*Aerial photograph (above) taken in September 2013 from a helicopter platform above southern resident killer whales . Research approach authorized by National Marine Fisheries Permit # 15569. Photo by Holly Fearnbach.*

*Green Sea Turtle Ecological Research, Orange County, CA - Members of the SWFSC/MMTD Jeff Seminoff, Tomo Eguchi, and Joel Schumacher conducted field work in San Gabriel River and Seal Beach National Wildlife Refuge on 28-29 August. This project is a collaboration between biologists at SWFSC and the Southwestern Regional Office in Long Beach (PIs Dan Lawson and Tina Fahy). Three green turtles were captured: they ranged in size from 54 to 75 cm straight carapace length and 21 to 60 kg in body weight. All turtles were equipped with ultrasonic transmitters as part of an ongoing study of habitat use in the area. Contact PIs [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) or [Jeffrey.Seminoff@noaa.gov](mailto:Jeffrey.Seminoff@noaa.gov) for more information.*



**Press:**

*Turtles are bay's best-kept secret (Jeff Seminoff)*  
<http://www.utsandiego.com/news/2013/sep/01/turtles/>

**Awards, grants and recognition:**

SWFSC-SIO Doctorate Student becomes “Dr.” – Alyson Fleming successfully defended her doctoral dissertation “Characterizing population structure of cetaceans within an ecological context” last week. Congratulations Dr. Fleming!

### **Week of 2 September 2013**

#### **Field work:**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, July – August* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project and last week ended the 2013 season. On the last night, a single female turtle was nesting (late in the season!) but no hatchlings emerged. The last week added samples from 45 hatchlings from 7 nests to the collection, making the grand total for 2013 5,672 hatchlings sampled. Contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) for more information.



*Photo Above: One of the final hatchlings of the season makes its way to the water.*

*Harbor Porpoise Passive Acoustic Research, Monterey Bay, CA* - Eiren Jacobson (SIO student) and Karin Forney successfully designed, assembled and deployed a network of 11 acoustic moorings (see map below) during the past two weeks to monitor harbor porpoise in Monterey Bay, CA. Moss Landing Marine Laboratories provided logistics, small boat, and diver support for this collaborative SWFSC//MLML project funded under a grant from the California Institute for Energy and Environment. The deployments went very well, requiring three half-days on the water. For the eleven moorings, 5 acoustic releases with expendable concrete anchors, and 6 fully-retrievable diver-deployed moorings with sand anchors were used. The study is a pilot project to develop design criteria for using passive acoustic methods to monitor trends, abundance, and potential impacts of marine renewable energy facilities (or other anthropogenic activities) on harbor porpoise off California. The moorings will remain in place for about 4 months, with retrieval scheduled in early January 2014. Coordinated aerial surveys are planned for October (when weather conditions are generally best) to obtain paired visual/acoustic data on porpoise occurrence. Eiren Jacobson plans to analyze the collected data as part of her doctoral research at SIO. Contact [Karin.Forney@noaa.gov](mailto:Karin.Forney@noaa.gov) for more information.



*Southern Resident Killer Whale Health and Condition Research, Puget Sound, WA, September* - In collaboration with the Center for Whale Research, MMTD scientists John Durban and Holly Fearnbach will this week begin a month-long field effort to assess the body condition, size and growth of individual southern resident killer whales, in order to assess the nutritional status of these Endangered whales. Funded by the NOAA Northwest Fisheries Science Center, this is a continuation of work first conducted in 2008, using a helicopter platform to obtain vertical images of whales from above in order to measure key morphometrics. This project is based on San Juan Island, WA, and will continue through the month of September. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov).

*Gray Whale Population Abundance & Trends Research, Granite Canyon, CA* - The Granite Canyon Research Lab has been the site for shore-based surveys of southbound gray whales since the 1960s. The facility is located along a section of coast that is isolated from the noise of port facilities and at a point where the shallow shelf that migrating whales follow is close to the shore. In the past few years, we have taken some major steps to improve both the accuracy and precision of abundance estimates by improving the basic techniques used for counting and tracking whales as they migrate south. We are now poised to make another major improvement to this assessment effort by using thermal sensors linked to an automated counting algorithm to supplement the effort of the visual team. Under Phase II of an SBIR proposal, Toyon Corp has installed a system at Granite Canyon that feeds directly into a set of computers that will monitor the output from the sensors, detect blows, estimate pod sizes and produce counts of passing whales (see photo). The system will only perform effectively during excellent weather conditions, but when the weather is adequate it can collect data 24 hrs/day. If this system performs as expected it will allow us to reduce the cost of the surveys by shortening the field season for visual watch teams and addressing the issue of calibration factors for differences between day and night migration rates. We plan to collect standard visual data to compare with the estimates from the sensors this January. Contact [Wayne.Perryman@noaa.gov](mailto:Wayne.Perryman@noaa.gov) for more information.



*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 30 August. Three groups totaling 45 dolphins were encountered and more than 800 digital photo-identification images and one biopsy sample were collected. In addition, two groups of common dolphins were observed and three blue whales were photo-identified and biopsied. For more details on this project please contact [Dave.Weller@noaa.gov](mailto:Dave.Weller@noaa.gov)

**Press:**

*Why Were Sea Lions Starving?* (Sarah Wilkin, Russ Vetter, **Mark Lowry**)

<http://www.onearth.org/articles/2013/08/sea-lion-pups-starved-this-year-in-the-waters-off-california>

**Week of 19 August 2013**

**Field work:**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, July – August* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. As nests continue to produce hatchlings in good numbers, we have extended the season through August 31<sup>st</sup>. This week the team saw more good emergences and they were able to sample 15 more nests. The milestone of 5,000 samples for the year has been exceeded; we now have 5,325 samples for the season. Contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) for more information.



*Photo: A hatchling track crosses over a female turtle track at Sandy Point.*

**Press:**

*Deadly Sea Lion Mystery Draws Biologists to Remote Island in Search of Clues* (**Mark Lowry**)

<http://www.wired.com/wiredscience/2013/08/island-sea-lion-pupdate/>

*Baby Boom of Gray Whale Calves Complete First Migration* (**Wayne Perryman**)

<http://www.kpbs.org/news/2013/aug/14/baby-boom-gray-whale-calves-complete-first-migrati/>

**Other of Note:**

*ETP Spinner Dolphin Genetic Sampling, The Smithsonian Institution's National Museum of Natural History, Washington D.C.* – The goal of this project is to describe a cline of variation in whitebelly and eastern spinner dolphins in the eastern tropical Pacific (ETP) Ocean. Last week, Matt Leslie - SIO PhD Candidate conducting dissertation research with the MMTD Genetics Group - visited the NMNH's Marine Mammal collection in Suitland, Maryland to collect teeth from ETP spinner dolphin skulls. These specimens were collected from the tuna-purse seine fishery and accessioned by Bill Perrin and colleagues in the 1970's and 80's. These skulls represent a unique opportunity to marry morphometrics, external body features and environmental data with genetics for a complete characterization of this rare clinal phenomenon. Matt will add the genetic component of this study by extracting DNA from the teeth and genotyping selected SNP markers. Matt collected teeth from 118 dolphins during his visit to the NMNH. He will be collecting material from additional



skulls accessioned in the Los Angeles County Museum and the San Diego Natural History Museum in the coming weeks. Contact: [Matthew.Leslie@noaa.gov](mailto:Matthew.Leslie@noaa.gov) for more information.

*Photo Above: Matthew Leslie with spinner dolphin skull collection at the National Museum of Natural History, Washington D.C.*

### **Week of 12 August 2013**

#### **Field work:**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, July – August* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. With nesting continuing into August this year (there were 2 leatherback nests on August 7<sup>th</sup>), we have several more nests to sample before the end of the month. We reached and surpassed our milestone of 25,000 samples collected since the start of this project, five years ago. The sample count for this year stands at 4,860 and we expect to pass 5,000 for this year alone. This was not expected as there are about as many nests as last year when we collected 3,266 samples. Contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) for more information.



*Photo Above: Two hatchlings from the same nest vary in size.*

*Southern California Behavioral Response Studies (SoCal BRS), Southern California Bight, weeks of 29 July and 5 August* - The first leg of the 2013 SoCal BRS ended last week. This is a multi-institutional study of the response of cetaceans to Navy sonar. This year marks a milestone in this 5-year study in being the first year to use an actual Navy ship as the experimental sound source. This year, behavior-recording tags were deployed on blue whales, fin whales, Risso's dolphin, and Cuvier's beaked whales. One of the Cuvier's beaked whales was exposed to actual Navy sonar (at a range of over 20 miles) and the other species were exposed to either controls (no sound) or simulated Navy sonar. The SWFSC team was composed of Jay Barlow, Jeff Moore, Karin Forney, Jennifer Keating and SIO student Eiren Jacobson aboard an independent visual and acoustic survey vessel (a 65' motor-sailer *Derek M. Baylis*). Together with Cascadia contractor Sophie Webb, they were tasked with (and successful in) finding long-diving whales (especially beaked and sperm whales) for tagging and playback studies. On the last day of survey effort, the acoustic team localized and tracked down a sperm whale (previously named "Mango") that had been seen on each year of the SOCAL-BRS program since 2010. New acoustic gear tested on this cruise included a modified SWFSC-designed Towed Tetrahedral Hydrophone Array and a Drifting Acoustic Spar Buoy Recorder (DASBR) system. Contact [Jay.Barlow@noaa.gov](mailto:Jay.Barlow@noaa.gov) for more information.

#### **Press:**

*U.S. Navy Ships Participate in Marine Mammal Studies (MMTD's science featured)*

[www.yumanewsnow.com/index.php/news/latest/3936-u-s-navy-ships-participate-in-marine-mammal-studies](http://www.yumanewsnow.com/index.php/news/latest/3936-u-s-navy-ships-participate-in-marine-mammal-studies)

*Wild turtle chase/With changes to bay, green sea turtles strike out for new depths (Jeff Seminoff)*

<http://www.utsandiego.com/news/2013/aug/03/environment-green-sea-turtles-san-diego-bay/>

### **Week of 5 August 2013**

#### **Field work:**

*Southern California Behavioral Response Study (SoCal BRS), Southern California Bight, weeks of 29 July – 5 August* – This is a multi-year, collaborative project to study of the response of cetaceans to Navy sonar. Cetaceans will be tagged to monitor their behavior and will then be exposed to Navy sonar-type signals. In previous years, a simulated sonar source was used that was two orders of magnitude less than an actual Navy ship. This year, a Navy vessel will be provided during a portion of this project. The expected sound exposure will be similar, but the vessel will be much farther away from the animals and thus the effect of range can be tested. The SWFSC effort is conducted on a stand-alone passive acoustic survey vessel named the *Derick Baylis*, a 65' motor sailer. The acoustic team includes Jay Barlow, Jennifer Keating, and Eiren Jacobson, and the visual survey team Karin Forney, Jeff Moore and Sofie Webb (Cascadia Research). This collaboration will also include researchers from Cascadia Research, Southall Environmental Associates, University of St. Andrews, Duke University, and the U.S. Navy all working aboard a separate vessel, the *Truth*. Contact Jay Barlow for more information.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands, July – August* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. Going into August, the weather has been hot and dry and hatching has been earlier in the evening than usual. To date, 4,425 samples have been collected and several more nests are expected this month. We are now only 222 samples away from the milestone of 25,000 samples collected on this project and expect to surpass this over the weekend. Contact Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)) or Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)) for more information.



*Photo Above: Shane Morales and Violet Campbell (STAR Fellows) and assistant Drue Frey test the fitness of hatchlings that have just emerged by placing them in a 2-meter arena.*

### **Week of 29 July 2013**

#### **Field work:**

Mark Lowry and Jim Carretta will conduct pinniped field studies at San Clemente Island during 26-29 July 2013. While at the island they will census California sea lions and northern elephant seals, and collect California sea lion scat samples for diet studies.

Mark Lowry and Susan Chivers will conduct pinniped field studies at San Nicolas Island during 30 July-1 August 2013. While at the island they will collect California sea lion scat samples for diet studies.

*Southern California Behavioral Response Study* – This week, a team of scientists from the SWFSC left to participate in the first 2-week leg of the Southern California Behavioral Response Study (SoCal-BRS). This is a multi-year, collaborative project to study of the response of cetaceans to Navy sonar. Cetaceans will be tagged to monitor their behavior and will then be exposed to Navy sonar-type signals. In previous years, a simulated sonar source was used that was two orders of magnitude less than an actual Navy ship. This year, a Navy vessel will be provided during a portion of this project. The expected sound exposure will be similar, but the vessel will be much farther away from the animals and thus the effect of range can be tested. The SWFSC effort will be in a stand-alone passive acoustic survey vessel named the *Derick Baylis*, a 65' motor sailer. The acoustic team will include Jay Barlow, Jennifer Keating, and Eiren Jacobson, and the visual survey team will include Karin Forney, Jeff Moore and Sofie Webb (Cascadia Research). This collaboration will also include researchers from Cascadia Research, Southall Environmental Associates, University of St. Andrews, Duke University, and the U.S. Navy all working aboard a separate vessel, the *Truth*.

*Bottlenose Dolphin Health Assessment, Mississippi Sound, 29 July - 5 August 2013* - A team of NOAA Scientists and other collaborators are conducting health assessments on bottlenose dolphins in the Mississippi Sound as part of the Deepwater Horizon (DWH) Natural Resource Damage Assessment (NRDA). Joel Schumacher (Marine Turtle Ecology & Assessment Program) will join other wildlife biologists, veterinarians, and epidemiologists on the catch and release team for the remaining week of the project.

*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 26 July. Five groups totaling 21 dolphins were encountered and more than 400 digital photo-identification images were collected. In addition, one group of common dolphins (totaling ~ 90 individuals) and one blue whale were observed. In collaboration with John Durban, during this survey we successfully initiated the use of laser-metric photogrammetry to obtain morphometric measurements of bottlenose dolphins. For more details on this project please contact Dave Weller.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands*– The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. This week hatching continued to be very good, with 50-60 hatchlings emerging from each natural nest. To date, the team has sampled 91 nests and 3,598 hatchlings. Tropical Storm Dorian is expected later this weekend and may bring some wind and rain to the island. Three additional volunteers arrive this weekend (Amy, Mike and Jodi – all have volunteered in previous years). For more information contact Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)) or Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)).



*Clockwise from top left:* (1) Erin LaCasella marks a nest that has just emerged. (2) STAR Fellow Violet Campbell and volunteer Christella Campbell assess a recent green turtle crawl. (3) Visitors to the project, Wendy Dow (left; Knauss Marine Policy Fellow at NOAA) and Carrie Selberg (right; NOAA Fisheries Chief of Staff) monitor an emerging nest.

### **Awards, grants and recognition:**

Bill Perrin's last day in Federal service will be 2 August, marking the end of chapter in what is a distinguished and remarkable career. Bill has served as a dependable resource, mentor and colleague since he joined Southwest Fisheries Science Center 46 years ago, and we look forward to continuing to work with him on a number of ongoing projects in the future. He will spend Friday, fittingly, discussing the tuna-dolphin issue with students and colleagues at a Scripps Institution of Oceanography symposium. We are excited to celebrate with him as a Center and a Division following his retirement on the 8th. Congratulations, Bill! While Friday by no means signals the end of your career, it is an opportune time to reflect and thank you for your seemingly countless contributions to marine mammal science, your unwavering scientific integrity, and your friendship.

### ***Week of 22 July 2013***

### **Field work:**

*Aerial Survey of Steller Sea Lion Rookeries, British Columbia and Alaska* - Morgan Lynn continues to work with a team from AFSC that is collecting vertical aerial photographs of Steller sea lion rookeries in British Columbia and Alaska. Contact Wayne Perryman for more information.

2013 Sardine-Hake Survey, Annette Henry will participate on the Fisheries Resources Division's Sardine-Hake (Sake) Survey during 22 July – 11 August.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands*– The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. Another great week in St. Croix for the project. The sample count is now at 2,727 and nest hatching continues to be good. In addition, females are still nesting (about 5 within the last week). Erin LaCasella is now with the team and Amy Frey arrives on July 21<sup>st</sup>. For more information contact Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)) or Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)).



A nest emerges and hatchlings head down the beach.

### **Week of 15 July 2013**

#### **Field work:**

*Aerial Survey of Steller Sea Lion Rookeries, British Columbia and Alaska* - Morgan Lynn continues to work with a team from AFSC that is collecting vertical aerial photographs of Steller sea lion rookeries in British Columbia and Alaska. Contact Wayne Perryman for more information.

*California and Steller Sea Lion Aerial Survey, California and Oregon* - On July 5<sup>th</sup> Mark Lowry began an aerial photographic survey of Steller sea lions and California sea lions at the Channel Islands in southern California and along the mainland coast from Point Conception, California to Cape Blanco, Oregon. This survey is ongoing. Contact Mark Lowry for more information.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. It was a great week in St. Croix for the project. Despite Tropical Storm Chantal trying to take a swipe at the island earlier this week, there were few effects from the storm and sampling has been going really well. This year there are about as many nests on the beach as last year, but the emergence success has been much higher. We've been getting 50-60 hatchlings from each nest as opposed to last year when 15-30 was the norm. The sample count is now at 2,113. Robin LeRoux arrives July 13<sup>th</sup> and Alex Gaos is now with the team to learn techniques to apply to hawksbills in Nicaragua and El Salvador later this year. For more information contact Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)) or Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)).



Hatchlings make their way down a sandy slope from a nest.



Alex Gaos points out a leatherback track from the previous evening.



Alex Gaos helps STAR fellow Shane Morales measure hatchlings.

**Press:**

*Ribbon Seal ESA Listing Decision*

Listing the ribbon seal under the Endangered Species Act was deemed Not Warranted in the second round of review of the petition to list this ice seal as endangered due to global warming issues. The Biological Review Team, which included Barb Taylor, concluded that "the BRT's collective judgment was that there is a 4% + 13% = 17% chance that the ribbon seal population will decline to 5,000 individuals before the end of the current century". The current population numbers between 200,000 and 300,000.

Their Report and the listing decision can be found at:

<http://alaskafisheries.noaa.gov/protectedresources/seals/ice.htm>

*San Francisco Chronicle*

\_NMFS denies ribbon seal endangered species listing\_/By DAN JOLING, Associated Press  
ANCHORAGE, Alaska (AP) — The federal government has rejected an endangered species listing for a seal species that relies on sea ice for molting and reproducing.

<http://ww3.hdnux.com/photos/22/53/22/4895906/3/628x471.jpg>

Read more: <http://www.sfgate.com/default/article/NMFS-denies-ribbon-seal-endangered-species-listing-4654968.php>

**Week of 8 July 2013**

**Field work:**

*Aerial Survey of Steller Sea Lion Rookeries, British Columbia and Alaska* - Morgan Lynn continues to work with a team from AFSC that is collecting vertical aerial photographs of Steller sea lion rookeries in British Columbia and Alaska. The effort began two weeks ago in British Columbia, and the team has been stuck in Kodiak for several days due to persistent fog. The 3-camera mount system used for this survey was developed here at the SWFSC, and Morgan acts as the lead camera technician for this effort.



*California and Steller Sea Lion Aerial Survey, California and Oregon* - On July 5<sup>th</sup> Mark Lowry began an aerial photographic survey of Steller sea lions and California sea lions at the Channel Islands in southern California and along the mainland coast from Point Conception, California to Cape Blanco, Oregon. The US Navy will provide a chartered aircraft for survey at the Channel Islands. The NMFS Alaska Regional Office provided funds for the Steller sea lion survey in California and Oregon. The Steller sea lion survey in California and Oregon is part of a range-wide survey of the eastern stock of Steller sea lions, with other surveys being conducted in SE Alaska, British Columbia, Washington, and Oregon. The California sea lion survey is being conducted to determine if the Unusual Mortality Event that occurred during winter and spring of 2013 affected pup production. The survey should take 10-14 days to complete.

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands* – The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. It was busy week for the field team in St. Croix, several new nests hatched and the sample count now stands at 1,215 hatchlings. This week the team welcomes Duke student Claire Gonzales who will be volunteering for 3 weeks. Two students from the University of Puerto Rico - Cristian Ramirez and Karla Barrientos - also spent 3 evenings with the team to learn techniques to apply to their projects in Puerto Rico. Nesting for leatherbacks has tapered off, but there are a few hawksbills and green turtles starting to nest. For more information contact Peter Dutton ([Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov)) or Kelly Stewart ([Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov)).



*Leatherback nest about to emerge on Sandy Point, St. Croix*



*Shane Morales and Violet Campbell – STAR Teaching Fellow and Sue Roden (background)*

*testing hatchling fitness prior to sampling.*



*Camryn Allen and Sue Roden handling leatherback hatchlings*

### **Press:**

NMFS announced that they are rejecting the petition to list white sharks in the Northeast Pacific under the Endangered Species Act. The decision is based largely on the status review done by SWFSC. Jeff Moore, Barb Taylor and Tomo Eguchi from MMTD were important team members in contributing much of the modeling and Structured Expert Opinion Making expertise. Charlotte Boyd also helped providing context from her risk analysis work. The Biological Review Team had members from all SWFSC Divisions. Read more about the decision:

<http://www.latimes.com/news/local/la-me-0629-great-whites-20130629,0,3365279.story>

*Odd-Looking Orcas May Be a Distinct Species (Robert Pitman/John Durban/Phil Morin)*

<http://www.wired.com/wiredscience/2013/07/odd-looking-orca-species/>

### ***Week of 1 July 2013***

### **Field work:**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands*– The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. This week the crew experienced mixed weather with some sunny days and a few days of rain from a couple of tropical waves that moved through the region. Hatching was a little inconsistent but there were some good nights and to date, 28 nests have hatched and 658 hatchling samples have been collected. Nesting continues to be fairly good, with 5 females nesting on June 25<sup>th</sup> alone. Camryn Allen will join the field effort this week - helping with the hatchling sampling as well as monitoring heart rates 2 on nesting female leatherbacks. Jeff Hester is also with the team – he is now on his year-long scholarship with the Our World - Underwater Scholarship Society and will be participating in both hatchling surveys and nesting female surveys to gain experience with turtle field biology. Contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) for more information.



Photos Above: Team with nest (Natalie Williams – FWS, Carla – local volunteer, Violet Campbell – STAR Teaching Fellow, Jeff Hester and Sue Roden); Adult female leatherback nesting track at Sandy Point, St. Croix.

**Press:**

*Science Daily*: Turtles Have Fingerprints? New Genetic Technique Reveals Paternity and More (**Dutton, Stewart**)

<http://www.sciencedaily.com/releases/2013/06/130624143922.htm>

*National Geographic*: Rare breed of killer whale may be new species (**Morin, Pitman**)

<http://news.nationalgeographic.com/news/2013/06/130627-killer-whale-orca-new-species-animal-science/>

*NOAA Fisheries Podcast*: The case of the dead dolphin (**Danil, Chivers, Beaulieu**)

<http://www.nmfs.noaa.gov/podcasts/index.html>

**Week of 24 June 2013**

**Field work:**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands*– The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. This season’s effort began June 17th with Kelly Stewart and local volunteers sampling 9 nests and collecting 227 hatchlings (see photo by Kelly Stewart). So far a total of about 350 nests have been laid over the last 3 months, and these are among the first batch to hatch. Team members joining this week include Suzanne Roden and volunteer Kaitlyn Moorehead. In addition Shane Morales and Violet Campbell are joining as Fellows with the STAR Research Teacher Program sponsored by the California State University (in partnership with many other organizations). Contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) for more information.



*Green Turtle Ecological Research, San Diego Bay* - The SWFSC green turtle research team continued field activities on Tuesday, June 18th and was successful at capturing two large female turtles. Both were recaptures from previous seasons (each has been captured 7 times!). One of the animals was originally tagged in 1990 and was an adult when it was first captured (SCL = 85.0 cm, Weight = 88 kg). She now measures 101.1 cm SCL and weighs 146 kg. The second animal was originally caught in 2004 and it weighed 18 kg. It now weighs 118 kg. Both animals were equipped with a GPS-Video-Depth tag that will collect fine-scale information on movement and habitat use in San Diego Bay. With the closure of the South Bay Power Plant, this information will help SWFSC scientists understand green turtle behavior in the post-Power Plant era. For more information on the project contact PIs Tomo Eguchi or Robin LeRoux. For details of tracking efforts contact Jun Okuyama.

*Health Assessment of Bottlenose Dolphins, Barataria Bay, LA, 15-30 June* - Nick Kellar will participate in Natural Resource Damage Assessment research focused on health assessments of bottlenose dolphins exposed to the Deepwater Horizon oil spill. Nick's work will use blubber samples from 20-30 animals to assess the relative concentrations/dynamics of stress hormones in this population. Contact [Nick.Kellar@noaa.gov](mailto:Nick.Kellar@noaa.gov) for more information.

*Bottlenose Dolphin Abundance Research, Pamlico Sound, NC, 14-30 June* - Tomo Eguchi is participating in a photographic capture-mark-recapture project focused on the Northern North Carolina Estuarine Stock of bottlenose dolphins. PBR has been exceeded for this stock due to entanglements in gillnets, a situation confirmed at a Take Reduction Team meeting, and this research will produce an updated abundance estimate. Eguchi is involved in sampling design, data collection, and data analysis for this SEFSC-funded project. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.

*Bahamas Odontocete Survey, 22 May – 23 June, Great Bahama Canyon* – This project, with a goal of collecting baseline data on movement and diving behavior of odontocetes by deploying satellite tags to provide a context for interpreting behavioral responses to sonar exposure at the US Navy's Atlantic Test and Evaluation Center (AUTEK) in the northern Bahamas, came to a successful close this past week. A total of 10 sperm whales, 3 Cuvier's beaked whales, and 2 melon-headed whales are now carrying tags which will provide valuable information in the days, weeks, and (hopefully) months to come. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

**Press:**

*DNA Sheds Light on Rare Killer Whale Type (Philip Morin/Robert Pitman/John Durban)*  
<http://www.livescience.com/37580-dna-sheds-light-on-rare-killer-whale.html>

**Week of 17 June 2013**

**Field work:**

*Leatherback Turtle Genetic Tagging/Demography Research, St. Croix, US Virgin Islands*– The goal of this project is to genetically tag leatherback turtle hatchlings in order to learn basic demographic parameters (which remain virtually unknown for marine turtles in general). This is the fifth year of this project. Kelly Stewart and Sue Roden will open the 2013 hatchling sampling effort the week of June 17<sup>th</sup>. Contact [Peter.Dutton@noaa.gov](mailto:Peter.Dutton@noaa.gov) or [Kelly.Stewart@noaa.gov](mailto:Kelly.Stewart@noaa.gov) for more information.

*Health Assessment of Bottlenose Dolphins, Barataria Bay, LA, 15-30 June* - Nick Kellar will participate in Natural Resource Damage Assessment research focused on health assessments of bottlenose dolphins exposed to the Deepwater Horizon oil spill. Nick's work will use blubber samples from 20-30 animals to assess the relative concentrations/dynamics of stress hormones in this population. Contact [Nick.Kellar@noaa.gov](mailto:Nick.Kellar@noaa.gov) for more information.

*Bottlenose Dolphin Abundance Research, Pamlico Sound, NC, 14-30 June* - Tomo Eguchi is participating in a photographic capture-mark-recapture project focused on the Northern North Carolina Estuarine Stock of bottlenose dolphins. PBR has been exceeded for this stock due to entanglements in gillnets, a situation confirmed at a Take Reduction Team meeting, and this research will produce an updated abundance estimate. Eguchi is involved in sampling design, data collection, and data analysis for this SEFSC-funded project. Contact [Tomo.Eguchi@noaa.gov](mailto:Tomo.Eguchi@noaa.gov) for more information.

*Bahamas Odontocete Survey, 22 May – 23 June, Great Bahama Canyon* – Ongoing – this research aims to collect baseline data on movement and diving behavior of odontocetes by deploying satellite tags to provide a context for interpreting behavioral responses to sonar exposure at the US Navy's Atlantic Test and Evaluation Center (AUTEK) in the northern Bahamas. To date, tags have been deployed on 3 Cuvier's beaked whales, 4 Sperm whales, and 2 Melon headed whales. Contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov) for more information.

#### **Press:**

##### *Turtles Have Fingerprints?*

New genetic technique reveals paternity and more. MMTD's sea turtle research featured on NMFS' home page. (**Kelly Stewart, Peter Dutton**)

#### **Week of 10 June 2013**

#### **Field work:**

*Bahamas Odontocete Survey, 22 May – 23 June, Great Bahama Canyon* – Ongoing – this research aims to collect baseline data on movement and diving behavior of odontocetes by deploying satellite tags to provide a context for interpreting behavioral responses to sonar exposure at the US Navy's Atlantic Test and Evaluation Center (AUTEK) in the northern Bahamas. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov)

*Green Turtle Research, 29 May – 8 June, San Jose, Costa Rica* - Michael Jensen met with research partners and participated in a site visit to assess foraging populations of green turtles at Isla Murcielago on the Pacific Coast.

#### **Awards, grants and recognition:**

*MMTD-SIO Doctorate Student Receives Post-doctoral Fellowship* - Alyson Fleming has been awarded a Knauss Postdoctoral Fellowship to begin in February 2013, with the Executive Branch (details to be determined). She plans to defend her dissertation in September. Congratulations Aly!

*MMTD-SIO Doctorate Student Advances to Candidacy* – Cotton Rockwood successfully presented his doctoral research proposal “Tools for a holistic approach to at-sea seabird conservation in the Pacific Ocean” at his qualifying exam on 4 June. Congratulations Cotton!

### **Week of 3 June 2013**

#### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – The 2013 survey came to a close last week on Friday, 31 May, after three consecutive days with no sightings. This year's total cow-calf count is 313, in the upper half of count totals for the 20-year time series. Contact Wayne Perryman for more information or see <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>.



*Green Turtle Ecological Research, San Diego Bay* - The SWFSC green turtle research team continued field activities on Thursday, May 30th and was successful at capturing a large juvenile green turtle. The turtle measured 71.6 cm in straight carapace length and weighed 70 kg. It was equipped with a GPS-Video-Depth tag that will collect fine-scale information on movement and habitat use in San Diego Bay. With the closure of the South Bay Power Plant, this information will help SWFSC scientist understand green turtle behavior in the post-Power Plant era. For more information on the project contact PIs Tomo Eguchi or Robin LeRoux. For details of tracking efforts please contact Jun Okuyama.



*Bahamas Odontocete Survey, 22 May – 23 June, Great Bahama Canyon* – Ongoing – this research aims to collect baseline data on movement and diving behavior of odontocetes by deploying satellite tags to provide a context for interpreting behavioral responses to sonar exposure at the US Navy's Atlantic Test and Evaluation Center (AUTEK) in the northern Bahamas. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov)

#### **Press:**

Type C personality/'Ross Sea' killer whale one of several species found around Antarctica (**Robert Pitman/John Durban**)

<http://antarcticsun.usap.gov/science/contenthandler.cfm?id=2853>

### **Week of 27 May 2013**

#### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – Seven more cow-calf pairs were recorded last week, bringing the season total to 310. See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> and contact Wayne Perryman for more information.

*Bahamas Odontocete Survey, 22 May – 23 June, Great Bahama Canyon* – The survey begins this week. Over the next month scientists from the MMTD (John Durban, Holly Fearnbach, Trevor Joyce) will be participating in collaborative field work to deploy satellite tags on cetaceans in the Great Bahama Canyon. This collaboration with the Bahamas Marine Mammal Research Organization, and funding from the Strategic Environmental Research and Development Program (SERDP), aims to collect baseline data on movement and diving behavior of odontocetes in the region to provide a context for interpreting behavioral responses to sonar exposure at the US Navy's Atlantic Test and Evaluation Center (AUTEK) in the northern Bahamas. This is the third and last of three annual surveys since 2011, with focus on six priority species: Cuvier's beaked whales, Blainville's beaked whales, Gervais' beaked whales, sperm whales, melon-headed whales and short-finned pilot whales. For more information contact [John.Durban@noaa.gov](mailto:John.Durban@noaa.gov)

### **Week of 20 May 2013**

## Field work:

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – Last week's calf count was 24, about 1/2 of last week's count, so the bulk of the cow-calf migration seems to have passed north of our survey site. The total for the season is now 303 calves, bringing the 2013 count above the average of calf production for the 20 year time series. Contact Wayne Perryman for more information or see <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>.



## Press:

*Gray whale spotted off Namibia is first to be documented in Southern Hemisphere* **Wayne Perryman/Aimee Lang**

<http://www.petethomasoutdoors.com/2013/05/gray-whale-spotted-off-namibia-is-first-to-be-documented-in-southern-hemisphere.html>

*MMTD research featured in NMFS' Podcast Rollout* - On 16 May, the Fisheries Office of Communications launched "[On the Line](#)", a collection of podcasts that use NPR-style interviews, photo galleries, and web stories to communicate the work of our scientists. The launch features MMTD's passive acoustics research on fin whales: [To Protect Fin Whales, Scientists Work on Their Listening Skills](#). Links:

- [http://www.nmfs.noaa.gov/podcasts/2013/05/listening\\_to\\_fin\\_whales.html](http://www.nmfs.noaa.gov/podcasts/2013/05/listening_to_fin_whales.html)
- SWFSC's multi-media site: <http://swfsc.noaa.gov/multimedia>
- SWFSC podcasts on itunes: <https://itunes.apple.com/podcast/noaa-southwest-fisheries-science/id250831169?mt=2>

## *Week of 13 May 2013*

## Field work:

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – A total of 58 cow/calf pairs were recorded last week, bringing this season's total to 279, slightly lower than the total last year on this date. On Wednesday, the team watched a group of an estimated 9 killer whales attacking a group of 10 humpback whales. The interaction lasted several hours with the killer whales appearing to attempt to isolate a smaller humpback from the group. The attack appeared to be unsuccessful (well from the perspective of the killer whales). This was also the highest calf count day for the week: 24 pairs. See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> and contact Wayne Perryman for more information.

*Sarasota Bay Dolphin Health Assessment Sampling, Sarasota Bay, FL, 6-10 May* - Last week Nick Kellar joined a capture/release team designed to assess health of bottlenose dolphins, as part of a larger assessment related to the Deep Water Horizon event. The team worked up 16 animals and 45 perfectly shaped blubber biopsies were obtained from the 15 NRDA animals (three different time points for each animal), with starting and ending samples coupled with blood samples for hormone measurement comparisons. Contact Nick for additional information.

**Press:**

Photographer Captures Stunning Killer Whale Attack on Dolphin (**Robert Pitman**)  
<http://www.wired.com/wiredscience/2013/05/killer-whale-flips-dolphin/>

**Week of 6 May 2013**

**Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – Last week's total calf count was 92, up from 82 the previous week. This brings the total count for the season to 221, 40 fewer than last year at this time, but about average for this date throughout the 20 year time series. See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> and contact Wayne Perryman for more information.

*Bahamas Odontocete Tagging, April/May 2013* - The latest in a series of collaborative field efforts to deploy satellite tags on cetaceans on and around the US Navy's Atlantic Undersea Test and Evaluation Center (AUTEK) in the northern Bahamas has just been completed. This ongoing project specifically aims to monitor the movements and diving behavior of cetaceans in relation to Navy exercises involving the use of active sonar. This is a collaboration between the Marine Mammal and Turtle Division of Southwest Fisheries Science Center (SWFSC), the Bahamas Marine Mammal Research Organization (BMMRO) and the US Naval Undersea Warfare Center (NUWC), with funding from the US Navy's Living Marine Resources (LMR) program. This season, tags were deployed on melon-headed whales ( $n=2$ ), rough-toothed dolphins ( $n=1$ ) and sperm whales ( $n=2$ ). These small LIMPET tags are expected to transmit location and dive data over the coming weeks, which will be related to activities on the AUTEK range and estimated sonar levels. Contact John Durban for more information.

*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 30 April. Four groups totaling 41 dolphins were encountered and more than 800 digital photo-identification images were taken. In addition, one group of 60 common dolphins and five gray whale mother-calf pairs were observed.

**Awards, grants and recognition:**

*MMTD's Acoustics Program receives research funding* - Jay Barlow and Shannon Rankin have received \$60K from NMFS' Ocean Acoustics Program for their project "Mapping Ocean Noise and Cetacean Density in the Santa Cruz Basin: A Meso-scale Operational Test of a Pelagic Buoy-based Recording System". Congratulations Jay and Shannon!

**Other of note:**

*MMTD science features prominently on NMFS homepage* – A NMFS homepage news story in March highlighted Wayne Perryman's research with colleagues on how NOAA scientists use aerial drones to spy - for research of course - on sperm whales. That was the third most popular news feature of the month, with 863 views. Nice job Wayne!

## **Week of 30 April 2013**

### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – The team had good weather last week, losing only 3.4 hrs of effort to weather. Eighty-two cow-calf pairs were recorded, putting the total number for this season slightly lower than last year at this date. Of note, Thursday (25 April) was the largest single-day calf count since 1998 (32). See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> and contact Wayne Perryman for more information.

### **Press:**

*Sea Lions Struggle On San Diego Coast (Mark Lowry/Jeff Laake)*

<http://www.kpbs.org/news/2013/apr/19/sea-lions-struggle-san-diego-coast/>

*Photographer Captures Dramatic Battle Between Orcas and Sperm Whales (Robert Pitman)*

<http://origin.www.wired.com/wiredscience/2013/04/orca-v-sperm-whale/>

### **Awards, grants and recognition:**

*MMTD doctorate student receives NSF Award* - In December, Eric Keen was awarded first place in a National Science Foundation competition for the best short video, as part of the 60<sup>th</sup> anniversary of its Graduate Research Fellowship Program. Eric's first-place, 90-second video is titled "Whales in Fjords". Congratulations Eric!

To view an NSF interview with Eric Keen:

<http://www.livescience.com/26735-marine-biology-grad-student-eric-keen-nsf-sl.html>

To view his video:

<http://www.livescience.com/26800-grad-student-makes-film-about-his-whale-research-video.html>

### **Other of note:**

*MMTD's ESP becomes SHARP* - The Ecosystem Studies Program has a new name. The program will now be called the Marine Mammal Spatial Habitat and Risk Program. The new name reflects changes in the research priorities of the program that have occurred over the last several years. The mission of the program is to investigate effects of habitat variability and human activities on marine mammal populations to support conservation and management. The primary focuses of the program are habitat and spatially explicit risk assessment. Habitat research includes quantifying spatial and temporal variability in oceanographic conditions and other components of the ecosystem, predicting species distributions, and identifying critical habitat. Spatially explicit risk assessment includes both individual and cumulative impacts from human activities such as shipping and fishing.

## **Week of 22 April 2013**

### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – Two afternoons were lost to high winds last week but 39 cow/calf pairs were counted. The number of adults and juveniles dropped to 22. Contact Wayne Perryman for more information or see <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>.

*Pinniped Ecological Research, Channel Islands* - Mark Lowry and Libby Ahlers collected California sea lion scat samples for diet studies from San Nicolas Island, 16-18 April and Mark and Kate Achilles will census California sea lions and northern elephant seals, and collect California sea lion scat samples for diet studies at San Clemente Island, 26-29 April. Contact Mark for more information.

### ***Week of 16 April 2013***

#### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – Last week brought high winds, rain, and fog, at the cost of a couple of days of effort. Gray whales continue to stream past the survey location; recorded were 24 adults, 16 juveniles, and 9 cow/calf pairs (bringing the total calf count to 10 for this season). Contact Wayne Perryman for more information or see <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>.

### ***Week of 8 April 2013***

#### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – Last week, the second week of the 2013 survey, saw the first northbound cow-calf pair of the season, in addition to 143 adult gray whales, 51 juveniles and 10 hours of fog.

See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> and contact Wayne Perryman for more information.

*Green Turtle Ecological Research, San Diego Bay, 9 April* - This is the first capture day since the South Bay Power Plant was imploded on 2 Feb 2013. It marks the beginning of a new capture regime in San Diego Bay for which the team's efforts will occur largely during warm-water months. With the power plant offline, capture success during the traditional winter season had been extremely low due to green turtle inactivity. For more information on the project contact PIs Tomo Eguchi or Robin LeRoux.

### ***Week of 1 April 2013***

#### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* – The first week of the survey was conducted last week in good weather conditions and adult and juvenile gray whales migrating northward. No cow/calf pairs were observed but this is not a surprise, as the season is early still. See <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464> and contact Wayne Perryman for more information.

*San Diego Coastal Bottlenose Dolphin Research, 27 March* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 27 March. Five groups, totaling about 50 dolphins, were observed and more than 1000 digital photo-identification images taken. In addition, two groups of northbound gray whales and two groups of common dolphins were encountered. Please contact Dave for more information.

*Marine Turtle Nesting Beach and Bycatch Monitoring, Sierra Leone & Liberia, West Africa, 27 March-8 April* – Ongoing. Contact Manjula Tiwari for more information.

#### **Press:**

*Blue whales at higher risk from ship strikes* (**Jessica Redfern**)

<http://www.oeregister.com/news/whales-501227-study-blue.html>

*Researchers seek further shipping lane changes to protect whales* (**Jessica Redfern/Monica DeAngelis**)

[http://www.dailybreeze.com/news/ci\\_22876312/researchers-seek-shipping-lane-changes-protect-whales](http://www.dailybreeze.com/news/ci_22876312/researchers-seek-shipping-lane-changes-protect-whales)

*Antarctic blue whales tracked in Southern Ocean* (**Jay Barlow**)

<http://media.theage.com.au/national/selections/blue-whales-tracked-in-australian-first-4143795.html>

### **Week of 25 March 2013**

#### **Field work:**

*Gray Whale Calf Production Survey, Piedras Blancas Light Station, Central California, 25 March – 1 June* - Today begins the 20th consecutive year of a shore-based survey of northbound gray whales designed to estimate calf production. This time series has been valuable for monitoring the recovery of the once Endangered North Pacific Gray Whale population, understanding population dynamics of a recovered baleen whale, and linking reproductive output with short-term fluctuations of seasonal ice in the Arctic. This effort is funded by the International Whaling Commission. Contact Wayne Perryman for more information or visit the following website: <http://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&id=16464>

*Marine Turtle Nesting Beach and Bycatch Monitoring, Sierra Leone & Liberia, West Africa, 27 March-8 April* - Manjula Tiwari is traveling to Sierra Leone to evaluate an ongoing nesting beach monitoring project, conduct beach surveys, and review bycatch data collection from artisanal fisheries. This project is in collaboration with colleagues at the Reptile and Amphibian Program of Sierra Leone. In Liberia, she will meet with colleagues at Save my Future (SAMFU), Sea Turtle Watch Program, and Conservation International and evaluate the effectiveness of nesting beach and bycatch monitoring programs carried out in collaboration with the coastal communities.

#### **Press:**

*Researchers deploy drones to spy on sperm whales* (Wayne Perryman)

<http://www.petethomasoutdoors.com/2013/03/researchers-deploy-drones-to-spy-on-sperm-whales.html>

*Leatherback turtle nest numbers way down* (Peter Dutton)

<http://www.sfgate.com/science/article/Leatherback-turtle-nest-numbers-way-down-4362377.php#ixzz2NzxnVYNd>

### **Week of 18 March 2013**

#### **Field work:**

*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States (MMTD scientists Jay Barlow and Paula Olson) have been conducting research on blue whales in the Southern Ocean using visual observations, passive acoustics, and satellite tagging. The project is sponsored by the Australian Government and part of the IWC-SORP Program. The project concluded late last week. For more information, see <http://www.marinemammals.gov.au/sorp/expeditions/antarctic-blue-whale-voyage-2013> and [Blue Whales @SORPnews](#)

*Pacific Orcinus Distribution Surveys (PODS), California Current, 27 February – 20 March* – Ongoing. The goal of the PODS research project, led by the NWFSC and conducted aboard the SHIMADA, is to study the winter/spring distribution and behavior of southern resident killer whales in 'outer coastal' waters off Washington, Oregon and California. Tina Yack is the senior acoustician.

*Week of 25 March 2013*

**Field work:**

*Unmanned Aerial System Sampling of Large Whales, Kaikoura, New Zealand, 17 February – 10 March* –The project has successfully concluded. Accomplishments include successful launch and retrieval of UASs from large and small boats, and high resolution photographs (see below) that allow for quantification of body size and shape of cetaceans (sperm whale photographs collected). A NMFS homepage news story this week provides an overview of the project, as does the project website: <http://www.spermwhalesnz.blogspot.com/> Contact Wayne Perryman for more information.



*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States (PRD scientists Jay Barlow and Paula Olson) are conducting research on blue whales in the Southern Ocean using visual observations, passive acoustics, and satellite tagging. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at <http://www.marinemammals.gov.au/sorp/expeditions/antarctic-blue-whale-voyage-2013> and [Blue Whales @SORPnews](#)

*Pacific Orcinus Distribution Surveys (PODS), California Current, 27 February – 20 March* – Ongoing. The goal of the PODS research project, led by the NWFSC and conducted aboard the SHIMADA, is to study the winter/spring distribution and behavior of southern resident killer whales in 'outer coastal' waters off Washington, Oregon and California. Tina Yack is the senior acoustician.

**Press:**

*Scientists Use Aerial Drones to Study Sperm Whales Up Close* – **Wayne Perryman**

See <http://www.nmfs.noaa.gov/>

### **Awards, grants and recognition:**

Funding received for health assessment research using hormone assays – Work continues to ascertain the effects the Deepwater Horizon oil spill has had on populations of cetaceans in the northern Gulf of Mexico. Nick Kellar has received \$50K to help in additional sampling as part of live capture health assessments of bay, sound, and estuarine bottlenose dolphin populations exposed to varying levels of oiling. The resulting samples will be analyzed in part to assess potential residual endocrine effects associated with chronic oil exposure. Congratulations Nick!

### **Other of note:**

PRD becomes MMTD – In an effort to provide greater clarity, within the agency, and to our external constituents and partners, with respect to what we do, the division has received approval to change our name. We are now “The Marine Mammal and Turtle Division”. The website will be changing soon.

### ***Week of 4 March 2013***

### **Field work:**

*Unmanned Aerial System Sampling of Large Whales, Kaikoura, New Zealand, 17 February – 10 March* – Testing and sampling continues to go well. The UAS team (Wayne Perryman and Don LeRoi) has now successfully launched, retrieved, and sampled with the quad- and hexacopter from the research vessel and small boats. A variety of camera systems have been placed on the UAS platforms, including a “Go Pro” camera. Results are impressive (see photo below). See <http://www.spermwhalesnz.blogspot.com/> and contact Wayne Perryman for more information.



*Retrieval of Passive Acoustic Moorings, Central California Coast, 26 Feb* - Karin Forney, Daniel Palacios, Jim Harvey (Moss Landing Marine Laboratories, MLML) and divers Scott Gabara and Mike Fox (MLML) successfully retrieved the remaining passive acoustic moorings that were deployed off San Luis Obispo County in support of the Diablo Canyon Seismic Survey Cetacean Monitoring program. This completes SWFSC field efforts for this project to monitor harbor porpoises and other cetaceans. In total, porpoise echolocation-click detectors (CPODs) were deployed at five separate locations for 2-3 months, providing novel data on variability in porpoise occurrence patterns in this area. Contact Karin Forney for more information.

*Northern Elephant Seal Survey, Channel Islands, Southern California Bight, 4-8 March* - Mark Lowry will conduct a fourth and final aerial photographic survey at San Miguel Island, Santa Rosa Island, and San Nicolas Island this week. This survey will census pups produced during the 2013 pupping-breeding season and adult females. These surveys are made with a P-68 Partenavia Observer aircraft chartered from Aspen Helicopters. It is a high-wing, twin-engine aircraft with a glass nose which provides the pilot with excellent forward and downward viewing capability which is needed for flying over beaches occupied by elephant seals. A Canon EOS-1Ds Mark III, 20 megapixel digital camera is mounted inside the belly of the aircraft for taking vertical photographs of beaches occupied by elephant seals. The camera is connected to a laptop computer, a GPS receiver, and a radar altimeter for recording geographical position and altitude of each photograph. Contact Mark Lowry for additional information.



*Antarctic Killer Whale Ecological Research, Antarctic Peninsula and McMurdo Sound* – Field research has been successfully concluded and Robert Pitman and John Durban are now back home in San Diego. Final tally for the season:

- 3 tags on Type A killer whales (2 depth recording, 1 location only)
- 7 tags on Type C killer whales (4 depth recording, 3 location only)
- 6 tags on Type B killer whales (including both small and large form Type B; 3 depth recording, 3 location only)
- 6 tags on Antarctic minke whales (3 depth recording, 3 location-only)

All but two tags continue to transmit as the Antarctic winter sets in. Also collected were photographic images of killer whales from the Antarctic Peninsula and McMurdo Sound field sites - these will be a large contribution to our dataset for mark-recapture estimates of abundance. Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale-TrackMap/>. Contact Robert Pitman or John Durban for more information.

*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States (PRD scientists Jay Barlow and Paula Olson) are conducting research on blue whales in the Southern Ocean using visual observations, passive acoustics, and satellite tagging. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at <http://www.marinemammals.gov.au/sorp/expeditions/antarctic-blue-whale-voyage-2013> and [Blue Whales @SORPnews](#)

*Pacific Orcinus Distribution Surveys (PODS), California Current, 27 February – 20 March* – Ongoing. The goal of the PODS research project, led by the NWFSC and conducted aboard the SHIMADA, is to study the winter/spring distribution and behavior of southern resident killer whales in 'outer coastal' waters off Washington, Oregon and California. Tina Yack is the senior acoustician.

**Press:**

*Decline in leatherback turtles reported*

[http://www.upi.com/Science\\_News/2013/02/27/Decline-in-leatherback-turtles-reported/UPI-21921362005507/](http://www.upi.com/Science_News/2013/02/27/Decline-in-leatherback-turtles-reported/UPI-21921362005507/)

(Peter Dutton)

<http://www.kpbs.org/news/2013/mar/01/pacific-leatherback-sea-turtle-headed-extinction-w/> (Scott Benson)

**Week of 25 February 2013**

### **Field work:**

*Unmanned Aerial System Sampling of Large Whales, Kaikoura, New Zealand, 17 February – 10 March* – Wayne Perryman has been invited by the University of Otago and Woods Hole Oceanographic Institution to participate in a research cruise designed to investigate health and physiological questions about sperm whales. The SWFSC's role will be to evaluate the use of a small UAS aboard a research vessel as a tool for sampling cetaceans at sea. The hexacopter, designed and built by Don LeRoi (also part of the project) and affectionately named "Fat Albert," is water tight and was originally designed for sampling blows of whales. To date, a series of test flights from land and sea have been conducted and the team is now working to adapt Fat Albert for small boat work. See <http://www.spermwhalesnz.blogspot.com/> and contact Wayne Perryman for more information. *Photos Below: Wayne and Don with Fat Albert; Fat Albert in flight; photo from Fat Albert of sperm whale and researchers aboard a small boat.*



*Retrieval of Passive Acoustic Moorings, 26 Feb* - Karin Forney, Daniel Palacios, Jim Harvey (Moss Landing Marine Laboratories, MLML) and divers Scott Gabbara and Mike Fox (MLML) will retrieve the remaining passive acoustic moorings that were deployed off San Luis Obispo County in support of the Diablo Canyon Seismic Survey Cetacean Monitoring program on Tuesday, pending conducive weather and other logistical issues. The seismic survey was canceled in November, but the passive acoustic instruments already in the water were left in place for the expected 3-month battery life of the instruments, so they could collect baseline data on harbor porpoise occurrence patterns in this area. Contact Karin Forney for more information.

*Antarctic Killer Whale Ecological Research, Antarctic Peninsula and McMurdo Sound* – Field research has been successfully concluded and Robert Pitman and John Durban are now headed north across the Drake Passage aboard the research vessel PT. SUR. The location and depth satellite tags on Antarctic killer whales (Types A, large and small B, and C) and minke whales continue to transmit. Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale-TrackMap/> Contact Robert Pitman or John Durban for more information.

*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States (PRD scientists Jay Barlow and Paula Olson) are conducting research on blue whales in the Southern Ocean using visual observations, passive acoustics, and satellite tagging. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at <http://www.marinemammals.gov.au/sorp/expeditions/antarctic-blue-whale-voyage-2013> and [Blue Whales @SORPnews](#)

*Pacific Orcinus Distribution Surveys (PODS), California Current, 27 February – 20 March* - The goal of the PODS research project is to study the winter/spring distribution and behavior of southern resident killer whales in 'outer coastal' waters off Washington, Oregon and California. This vessel-based survey is currently conducted from the NOAA research vessel SHIMADA. Tina Yack will be the senior acoustician.

### **Week of 18 February 2013**

#### **Field work:**

*Antarctic Killer Whale Ecological Research, Antarctic Peninsula and McMurdo Sound* – A total of twenty-two animals have now been tagged (location-only, and dive depth tags) as part of this research effort. These include seven Type C/Ross Sea killer whales and 3 minke whales from McMurdo Sound, and nine killer whales (Types A, large B, and small B) and three minke whales from the Antarctic Peninsula region. A more detailed account of results to date is provided below in “Research Findings”. Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale-TrackMap/>. Contact Robert Pitman or John Durban for more information.

*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States (PRD scientists Jay Barlow and Paula Olson) are conducting research on blue whales in the Southern Ocean using visual observations, passive acoustics, and satellite tagging. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at <http://www.marinemammals.gov.au/sorp/expeditions/antarctic-blue-whale-voyage-2013> and [Blue Whales @SORPnews](#).

### **Week of 11 February 2013**

#### **Field work:**

*Antarctic Killer Whale Ecological Research, Antarctic Peninsula* – This past week, John Durban and Bob Pitman have been on board the R/V Point Sur (research vessel from Moss Landing Marine Lab), working with the US Antarctic Program. They are continuing their killer whales studies off the west side of the Antarctic Peninsula. Also on board are a team from Duke University (Ari Friedlaender, Andy Read, Doug Nowacek) studying the fine scale foraging behavior of humpback whales, and Nick Gales from the Australian Antarctic Division, who is deploying satellite tags to study the longer term migration behavior of minke and humpback whales. The killer whale work continues to be very productive: a large aggregation of Type B (small form) killer whales has been tracked over the past week: three satellite LIMPET tags have been deployed, facilitating follow-up studies to collect photo-identifications, photogrammetry images, biopsy samples and acoustic recordings over several encounters. Notably, a depth-recording LIMPET tag was deployed on an adult male Type B killer whale, so we currently have dive-depth data being transmitted from active tags on both adult males and females of each Antarctic killer whale types A, B and C. These data will fill key data gaps on foraging behavior, and further the comparison of habits and prey specialization between types. Another satellite LIMPET tag was deployed on an Antarctic minke whale (now 5 for the season). These tags are providing the first data on fine-scale movement and diving behavior for this species, and will allow an evaluation of the performance of small LIMPET tags alongside the implant satellite tags being deployed by Nick Gales during this project. Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale-TrackMap/> Contact Robert Pitman or John Durban for more information.



*Photo above: An adult male Antarctic Type B killer whale (small form), swims in front of the Research Vessel Point Sur. The killer whale has a thick coating of diatoms giving a yellow coloration to the skin. This diatom accumulation indicates a lack of turnover of the epidermis, and we hypothesize that these whales will soon need to travel to warmer waters (a "maintenance migration") to allow skin regeneration without the high cost of heat loss to frigid waters.*

*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States (PRD scientists Jay Barlow and Paula Olson) are conducting research on blue whales in the Southern Ocean using visual observations, passive acoustics, and satellite tagging. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at [Blue Whales @SORPnews](#)

*Pinniped Abundance Surveys* - Mark Lowry will conduct an aerial photographic survey of northern elephant seals at all Channel Islands in southern California and along the central California coast from Point Conception to Point Reyes during 12-17 February 2013. This survey will census maximum number of pups produced during the 2013 pupping-breeding season, and adult females. Thus far this year two aerial photographic surveys of elephant seals have been conducted at San Nicolas Island, San Miguel Island, and Santa Rosa Island (the three largest rookeries in the U.S.) as part of four surveys to estimate total number of adult females present at these rookeries during the pupping-breeding season. The estimated total number of adult females from four surveys (the next is planned for 3-5 March) will yield an estimate of total number of births and an estimate of pre-census mortality prior to the 12-17 February survey. Contact Mark for more information.



*Photo above: Northern elephant seals photographed at Santa Rosa Island from an altitude of 800 feet during an aerial photographic survey, 30 January, 2013*

*Photographic assessment of body shape changes in killer whales, with application to monitoring body condition of endangered southern residents* - This is a collaborative project between PRD/SWFSC (John Durban and Holly Fearnbach) and Sea World San Diego (Hendrik Nollens and Alan Garver) to conduct photographic monitoring to assess body changes over time in individual killer whales housed at Sea World San Diego. The aim is to further develop photogrammetric tools that can be used to monitor the body condition and nutritional status of wild populations of killer whales. Vertical overhead photographs will be collected each month over an annual period to provide repeat longitudinal measures of individual whales to identify measurement sites along the body axis that display variable widths within individuals over time, and between individuals of varying status. The results from this study will be integrated with a database of longitudinal photographs of free-ranging killer whales from both the North Pacific and Antarctica in order to identify sensitive measurement sites for photogrammetric assessment of body shape changes for this species. Most notably, this project will develop the tools necessary to monitor the nutritional status of the endangered “southern resident” population of killer whales that are thought to be food-limited in some years. Photographic images were collected by Holly Fearnbach on February 5<sup>th</sup> and 7<sup>th</sup> and sampling will continue for the next twelve months. Contact John Durban or Holly Fearnbach for more information.

**Press:**

San Diego Bay Green Turtle Research (**Jeff Seminoff**)

<http://www.utsandiego.com/news/2013/feb/03/green-sea-turtle-power-plant-endangered-species/>

**Week of 4 February 2013**

**Field work:**

*Antarctic Killer Whale Ecological Research, Antarctic Peninsula* – Another very productive week off the west side of the Antarctic Peninsula: four groups of killer whales sighted, including Type A and the smaller form of Type B. Type A's are a large form with striking black and white pigmentation that we have observed feeding on minke whales and elephant seals. However, we have spent relatively little time with this type, and we took the opportunity this week to deploy three tags on Type A whales, including two depth-recording satellite transmitter tags and one location-only transmitter tag for longer term tracking. This is proving to be a remarkable season: to date we have deployed tags on each of the three killer whale types found in Antarctica (Type A,  $n=3$ ; Type B,  $n=2$ ; Type C,  $n=7$ ), and data from these tags will provide a valuable comparison of the movement, diving behavior and habitat use of these types. We also deployed another location-only tag on an Antarctic minke whale this week, our fourth of the season, to investigate fine scale movements (e.g. anti-predation strategies, habitat use) and longer term migration behavior. This coming week we transfer to the *R/V Point Sur* for a month of focused killer whale studies. We are extremely grateful to Lindblad Expeditions, the National Geographic Society and the staff and crew of the National Geographic Explorer for hosting us over the past month: this has been our third season aboard the ship, and they keep getting better! Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale-TrackMap/> Contact Robert Pitman or John Durban for more information.



*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from

Australia, Chile, New Zealand, the United Kingdom and the United States will depart from Nelson, New Zealand on 30 January to study blue whales in the Southern Ocean. Visual observations, passive acoustics, and satellite tagging will be used. PRD scientists Jay Barlow and Paula Olson are part of the team. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at [Blue Whales @SORPnews](#)

**Press:**

*Cryptic beaked whales declining (Jeffrey Moore and Jay Barlow)*

<http://www.utsandiego.com/news/2013/jan/29/beaked-whale-marine-mammal-Navy-sonar/>

**Awards, grants and recognition:**

*PRD Receives NOAA Bronze Medals!* – Congratulations to Kerri Danil, Peter Dutton, Scott Benson, and Jeremy Rusin! – And many congratulations to our colleague, Senior Scientist Bill Perrin, who was awarded a Distinguished Career Award!

**Other of note:**

*First record of hawksbill turtle along the US west coast!* - SeaWorld personnel responded to a hawksbill sea turtle stranding in San Diego Bay on 29 January. The turtle was transferred to SWFSC by Robin LeRoux on 31 January. Not only is this the first ever species other than green turtles to be found in the Bay, it is the FIRST-EVER hawksbill turtle to be recorded along the U.S. West Coast. The hawksbill measured 95.5 cm CCL and weighed 64.4 kg. She was found just South of the Coronado Bridge by the 3rd hole of the golf course.



**Week of 28 January 2013**

**Field work:**

*Gray Whale Condition Research, Southern California Bight* - This effort is focused on estimating reproductive and nutritive condition of southbound gray whales based on measurements of length and width taken from vertical aerial photographs from a NOAA Twin Otter. Three hours of flight time remain and, weather pending, one more flight this week should bring the project to a successful close. Contact Wayne Perryman for more information.

*Antarctic Killer Whale Ecological Research, Antarctic Peninsula* – Killer whale surveys continued to be productive onboard the National Geographic Explorer over the past week: four groups of killer whales were sighted, with 30+ individual whales documented in identification photographs. Remarkably, all these whales could be matched to our existing collaborative database (40,000 photographs, 100+ contributors) including one group that we have photographed in January during each of the past five field seasons. These data on site fidelity and re-sighting rates will be invaluable for producing spatially-explicit abundance estimates. Holly Fearnbach leaves the ship and is

replaced by Bob Pitman this week; Bob and John Durban will be hosted by Lindblad Expeditions for one further trip onboard the National Geographic Explorer before transferring to the R/V Point Sur for another NSF-sponsored project that includes focused killer whale research in February. Tag update: Nine of the ten satellite tags deployed by John and Bob at the fast ice edge in McMurdo Sound earlier this season (now including 6 type C killer whales and 3 Antarctic minke whales) continue to work very well. Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale>. Contact Robert Pitman or John Durban for more information.

*Southern Ocean Research Partnership (SORP) – Antarctic Blue Whale Cruise, Southern Ocean* - Scientists from Australia, Chile, New Zealand, the United Kingdom and the United States will depart from Nelson, New Zealand on 30 January to study blue whales in the Southern Ocean. Visual observations, passive acoustics, and satellite tagging will be used. PRD scientists Jay Barlow and Paula Olson are part of the team. The project is sponsored by the Australian Government and part of the IWC-SORP Program. Follow the cruise at [Blue Whales @SORPnews](#)

*San Diego Coastal Bottlenose Dolphin Research* – As part of a joint SWFSC/SIO collaborative research program on coastal bottlenose dolphins, Dave Weller and Greg Campbell (SIO) conducted a small boat survey off San Diego on 23 January. One group of 22 dolphins was encountered and more than 200 digital photo-identification images collected. In addition, one group of 200-300 common dolphins and three groups of grays whales, including one northbound juvenile, were encountered. Contact Dave Weller for more information.

#### **Other of Note:**

*Advanced Technology Trials Successful* - Dave Weller and Wayne Perryman travelled to Granite Canyon last week to participate in a side by side test of two thermal sensor systems. This test is part of a Phase II SBIR grant to Toyon Corporation for the design and installation of a thermal sensor based system for counting southbound gray whales from this unique site. The goal is to reduce costs of shore based surveys of these whales and to allow us to increase the frequency and extend the duration of these surveys.



#### ***Week of 22 January 2013***

#### **Field work:**

Gray Whale Condition Research, Southern California Bight - This effort is focused on estimating reproductive and nutritive condition of southbound gray whales based on measurements of length and width taken from vertical aerial photographs from a NOAA Twin Otter. After losing 5 consecutive days to bad weather, a high pressure system moved in and the team flew 6 days last week (Tuesday-Saturday). Conditions for photography were near perfect. The migration peak has passed; only a few cow/calf pairs are still offshore of the Southern California Bight and pregnant females are rare. Thanks to efforts of our flight crew to cut costs by staying at North Island Naval Air Station and taking advantage of low fuel costs on the base, we have managed to save enough money to add 5 additional hours to our flight budget, bringing us to a total of 50 hrs, of which 12 remain. LTJG David Cowan and Ens Mike Hirsch deserve special thanks; both are excellent pilots and have contributed significantly to the success

of this effort. Contact Wayne Perryman for more information. *Photos: a large group of migrating gray whales; dolphins bow ride a migrating gray whale; a female with a young calf migrates south.*



Pinniped Abundance and Ecological Research, Channel Islands, Southern California Bight - Mark Lowry and Stephanie Nehasil will collect California Sea Lion scat samples from San Nicolas Island, 22-24 January, to be used for diet studies. Contact Mark for more information.

Antarctic Killer Whale Ecological Research, McMurdo Station, Ross Sea, and Antarctic Peninsula – Antarctic Peninsula: Durban and Fearnbach’s time onboard the National Geographic Explorer has continued to be successful into the second week. We deployed another satellite LIMPET tag on a Type B (small form) killer whale in the Gerlache Strait; this is a location-only transmitter tag, intended to enable longer term tracking into the winter months and high resolution tracking in the shorter term to facilitate relocation for follow up studies. We have observed these whales to feed on brushtail penguins at the surface (see photo), but the previously-deployed LIMPET tag continues to transmit astounding dive-depth data, dives regularly greater than 500m and even in excess of 700m on occasions. Our work in the coming weeks will focus on identifying the prey they are targeting at these depths. After returning to Ushuaia (Tierra del Fuego, Argentina) to change out the guests onboard, we are now southbound again in the South Shetland Islands. We expect more killer whales in the coming days. McMurdo Station, Ross Sea: Pitman returned to San Diego last Thursday from 1 month in the field. Nine of the ten satellite tags deployed at the fast ice edge by John Durban and him (now including 6 type C killer whales and 3 Antarctic minke whales) continue to work very well, with dive and location data coming in for both species. Of note, the killer whales are diving to over 700 m; minkes in the same area are regularly diving to only 80 m. Further information, including real time tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale>. Contact Robert Pitman or John Durban for more information.



**Press:**

*Beaked whale declines paper featured in SCIENCE NOW online (Jeffrey E. Moore/Jay P. Barlow)*

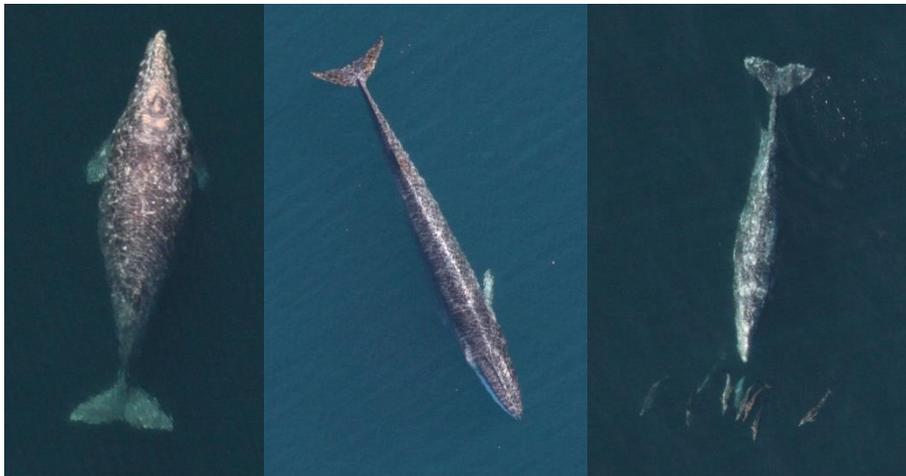
<http://news.sciencemag.org/sciencenow/2013/01/scienceshot-the-mystery-of-the-b.html?ref=hp>

Research paper: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0052770>

***Week of 14 January 2013***

**Field work:**

*Gray Whale Condition Research, Southern California Bight* - This effort is focused on estimating reproductive and nutritive condition of southbound gray whales based on measurements of length and width taken from vertical aerial photographs from a NOAA Twin Otter. Two flights were conducted this past week and about a dozen gray whales including several very wide, likely pregnant, females and 3 cow/calf pairs, were photographed. Also encountered were large groups of common dolphins and Risso's dolphins. Weather limited operations somewhat and a very large swell prevented calibration of the radar altimeter. About 35 hrs of flight time remain. Contact Wayne Perryman for more information. *Photos Below: A very pregnant female gray whale; a sleek fin whale; common dolphins bow ride in front of a gray whale.*



*Pinniped Abundance and Ecological Research, Channel Islands, Southern California Bight* - Mark Lowry conducted a northern elephant seal aerial photographic survey at San Miguel Island and Santa Rosa Island on 9 January. San Nicolas Island could not be surveyed the following day due to high winds that would make it too dangerous to fly the survey; the survey will occur later this month. Mark and Corey Sheredy will census California sea lions and northern elephant seals, and collect sea lion scat samples for diet studies at San Clemente Island this week (15-17 January).

*Antarctic Killer Whale Ecological Research, McMurdo Station, Ross Sea, and Antarctic Peninsula* – Robert Pitman finished up a month at McMurdo Station over the weekend working with colleagues as part of a NSF-funded project on apex predators. Identification photographs and 10 satellite tags deployed (9 still transmitting) will allow estimation of killer whale population size, and quantification of foraging behavior (dive depths and movements) of both killer whales and Antarctic minke whales. In addition, approximately 3 hrs of acoustic recordings of the distinctive Ross Sea Killer Whale were obtained for comparative analyses, and 10 biopsy samples collected to study trophic interactions between minkes and killer whales. John Durban has transferred from McMurdo to the Antarctic Peninsula where he and Holly Fearnbach will continue studies evaluating the ecosystem interactions of killer whales as top predators. John, Holly and (later) Bob are being hosted by Lindblad Expeditions onboard the expedition ship *National Geographic Explorer* until early February, when operations will transfer to the National Science Foundation charter vessel R/V *Point Sur*. Already, during the first full day off the Antarctic Peninsula, the team deployed a depth-recording satellite tag on a Type B killer whale (small form). These tags will be used to remotely monitor movement and diving behaviors over the coming weeks, to infer possible prey species and predation strategies; later work aboard the *Pt. Sur* will focus on prey mapping/sampling in important foraging areas identified from the tag data. Further information, including online tag tracking can be found at <http://swfsc.noaa.gov/PRD-KillerWhale> Contact Robert Pitman or John Durban for more information.

*Photos Below: Collecting acoustic data from Ross Sea Killer Whales; Pitman deploys a satellite tag on an Antarctic minke whale; a depth-recording satellite transmitter tag being deployed on the dorsal fin of a Type B killer whale off the western side of the Antarctic Peninsula. The tag was projected on the end of a crossbow bolt; the bolt fell away on contact with the whale (as shown), leaving the small tag attached.*





**Press:**

Aerial photos give perspective on gray whales (**Wayne Perryman**)

<http://www.utsandiego.com/news/2013/jan/10/tp-aerial-photos-give-perspective-on-gray-whales/>

***Week of 7 January 2013***

**Field work:**

*Gray Whale Condition Research, Southern California Bight* - The NOAA Twin Otter NOAA RF57 arrived in San Diego on Thursday (3 January) to begin photogrammetric sampling on southbound gray whales. This effort is focused on estimating reproductive and nutritive condition based on measurements of length and width taken from vertical aerial photographs. The research is funded by the IWC and is part of a long term study designed to investigate the impacts of weather and climate on eastern north Pacific gray whales. This year's effort is particularly important due to the anomalous ice conditions in the Arctic last spring, when ice extent was the most expansive in the 30 year time series, and last summer, when ice cover was at an all-time low. Photographic sampling will be conducted from San Diego over the next 30 days. Contact Wayne Perryman for more information. *Photos: The NOAA Otter with a new paint job, Morgan Lynn installs an image motion compensated camera system, and a vertical photograph of a pregnant gray whale.*



*Green Turtle Ecological Research, San Diego Bay* - On 9 January 2013, the SWFSC green turtle research team will continue green turtle capture efforts in San Diego Bay. Contact Robin LeRoux or Jeff Seminoff for more information.

*Pinniped Abundance and Ecological Research, Channel Islands, Southern California Bight* - Mark Lowry will conduct a northern elephant seal aerial photographic survey at San Nicolas Island, San Miguel Island, and Santa Rosa Island 9-11 January. This is the first of four planned surveys during the 2013 winter breeding season which will be used to estimate total number of adult females, from which number of births and total pup mortality will be estimated. The US Navy will provide a chartered aircraft for three of the surveys, with the fourth survey being funded from FY12 carryover funds that have been obligated through Department of Interior.

*Antarctic Killer Whale Ecological Research, McMurdo Station, Ross Sea* – Robert Pitman and John Durban are currently at McMurdo Station, Antarctica, as part of an NSF-funded project titled: “Benthic pelagic coupling in an intact ecosystem: The role of top predators in McMurdo Sound”. Since their arrival (15 December 2012), they have deployed 4 dive depth/location and 3 location-only tags (see photographs) on Ross Sea Killer Whales (RSKW, also known as “Type C” killer whales), a fish-eating ecotype that occurs commonly in McMurdo Sound, and 1 depth/location tag and 2 location-only tags on Antarctic minke whales. All 10 tags are working well and indicate that the killer whales are foraging mainly along the fast ice edge, diving for 10-15 minutes at a time, to depths of 300-400 m, which takes them to the bottom in shallower waters. This vertical foraging with repeated bounce dives over hours at a time is more similar to beaked whales than to the horizontal ranging of most forms of killer whales. The physiological and morphological adaptations that underpin this highly divergent lifestyle further suggest that RSKW is in fact a separate species of killer whale. In addition, there have been questions about whether this fish-eater depends mainly on large, relatively rare toothfish or much more abundant but much smaller other species of icefish that occur in the Sound – observations this season suggest that killer whales are capable of feeding on very small fish, as the photograph here shows. Contact Robert Pitman for more information.



**Press:**

*'Citizen scientists' explain mysterious die-offs, trace oil spills back to surprising culprits (Scott Benson, Karin Forney)*

[http://www.mercurynews.com/science/ci\\_22307439/citizen-scientists-explain-mysterious-die-offs-trace-oil](http://www.mercurynews.com/science/ci_22307439/citizen-scientists-explain-mysterious-die-offs-trace-oil)