Soundings

American Cetacean Society- Monterey Bay Chapter
PO Box H E, Pacific Grove, CA 93950

February 2013

AMERICAN CETACEAN SOCIETY-
MONTEREY BAY CHAPTER

Monthly meeting at **Hopkins Marine Station,** Lecture Hall, Boat Works Building
(Across from the American Tin Cannery Outlet Stores)
Meeting is open to the Public

Date: Thursday, February 28, 2013 Time: 7:30 PM.
PLEASE JOIN US AT 7:00 FOR REFRESHMENTS

Speaker: William F Gilly
Subject: The Mysterious Humboldt Squid in our Bay

INSIDE THIS ISSUE

There has been a lot of talk lately regarding those jumbo squid who keep washing up on our beaches. These creatures are normally found in ocean water up to a 1000 feet deep so what's happening? Dr. Bill Gilly- "Mr. Humboldt Squid" will be telling us at our monthly meeting so please come and find out.

Dr. Gilly has been studying Humboldt squid in the Gulf of California and the Pacific Ocean for the last 10 years. His group at Hopkins Marine Station uses of a variety of electronic tagging methods, an animal-borne video package (CritterCam), and hydro-acoustics to reveal natural behaviors of this adaptable predator in relation to physical and biological features of their environment. This squid supports the largest invertebrate fishery in the world and is a major prey item for sperm whales, Risso's dolphins and other marine mammals in the eastern Pacific.

CALENDAR

March 6, 3pm: Monterey Bay Aquarium Research Institute Lecture. "The Golden Shore." David Helvarg, Blue Frontiers Campaign

March 8, 12pm: Hopkins Marine Station Seminars. "Animal Phylogenies and What They Can Tell Us." Max Telford, University College London

March 7-10: 10th Annual San Francisco Ocean Film Festival. Pier 39, San Francisco

March 23, 8am-5pm: American Cetacean Society Los Angeles Chapter's Ultimate Whale Watch. Look for north bound gray whales, humpback whales, minke whales, dolphins, pinnipeds, and sea birds while traveling toward Catalina Island. For more info contact ACS/LA

April 27: Monterey Bay National Sanctuary 2013. Sanctuary Currents Symposium. "Change: Observations on the Shifting Ecology of the Sanctuary." California State University Monterey Bay

BOOK RECOMMENDATIONS

The Swordfish Hunters: The History and Ecology of an Ancient American Sea People
Bruce Bourque

Swordfish: A Biography of the Ocean Gladiator
Richard Ellis

Birthright: People and Nature in the Modern World
Stephen R. Kellert

The Universe Within: Discovering the Common History of Rocks, Planets, and People
Niel Shubbin

The Golden Shore: California's Love Affair with the Sea
David Helvarg

SCIENTISTS USE MARINE ROBOTS TO DETECT ENDANGERED WHALES

From Science Daily
Published: 1/9/13

Two robots equipped with instruments designed to "listen" for the calls of baleen whales detected nine endangered North Atlantic right whales in the Gulf of Maine last month. The robots reported the detections to shore-based researchers within hours of hearing the whales (i.e., in real time), demonstrating a new and powerful tool for managing interactions between whales and human activities.

The team of researchers, led by Woods Hole Oceanographic Institution (WHOI) scientists Mark Baumgartner and Dave Fratantoni, reported their sightings to NOAA, the federal agency responsible for enforcing the Marine Mammal Protection Act. NOAA Fisheries Service, in turn, put in place on Dec. 5 a "dynamic management area," asking mariners to voluntarily slow their vessel speed to avoid striking the animals.

The project employed ocean-going robots called gliders equipped with a digital acoustic monitoring (DMON) instrument and specialized software allowing the vehicle to detect and classify calls from four species of baleen whales -- sei, fin, humpback, and right whales. The gliders's real-time communication capabilities alerted scientists to the presence of whales in the research area, in the first successful use of technology to report detections of several species of baleen whales from autonomous vehicles.

The oceanographic research project was underway from Nov. 12 through Dec. 5, operating in an area called the Outer Fall, about sixty miles south of Bar Harbor, Me., and 90 miles northeast of Portsmouth, NH. Right whales are thought to use this area every year between November and January as a mating ground.

Two gliders were deployed by Ben Hodges and Nick Woods, also of WHOI, on Nov. 12 from the University of New Hampshire's 50-ft research vessel, the *Gulf Chal-*

lenger. The vehicles surveyed the area for two weeks, sending data to the researchers every two hours via satellite, prior to the scientific team's arrival Nov. 28 on the University of Rhode Island's research vessel *Endeavor*. The gliders continued to survey for another week before being recovered by the *Endeavor* on Dec. 4."We put two gliders out in the central Gulf of Maine to find whales for us," says Baumgartner, who specializes in baleen whale and zooplankton ecology. "They reported hearing whales within hours of hitting the water. They did their job perfectly."

Using the gliders's reconnaissance data and continued real-time updates, the science team was able to locate whales in just a few hours of searching. "We found our first right whale on the first day that we were surveying in decent weather conditions because the gliders were up there doing the leg work for us, to tell us where the animals were in real time," says Baumgartner.

The innovative whale detection system provides conservation managers with a cost-effective alternative to ship- or plane-based means of identifying the presence of whales, and gives whale ecologists new tools for understanding large animals that spend most of their lives out of human eyesight below the sea surface.

Whale researchers want to learn what draws whales to this part of the ocean during the late fall and winter. However, high winds and rough seas typical of that time of year make studying the animals very difficult.

"This presents a huge knowledge gap," says Baumgartner.

The labor-intensive work of surveying for whales, overseen by NOAA, is usually done by human observers on ships or airplanes, and is limited by the conditions at sea.

"We've been doing visual based surveys for a long time -- either from a plane or a boat. They have a lot of value, but they are limited, especially at certain times of the year," says Sofie Van Parijs, leader of the Passive Acoustic Research Group at NOAA's Northeast Fisheries Science Center (NEFSC). "These gliders provide a great complement to this system. Knowing where right whales are helps you manage interactions between an endangered species and the human activities that impact those species."

The success of the project is a result of years of productive collaboration among engineers, biologists and physical oceanographers at WHOI, scientists at the NEFSC Protected Species Branch in Woods Hole, and federal funders like the Office of Naval Research and NOAA's Applied Science and Technology Working Group Program. The gliders are operated by Fratantoni, a physical oceanographer; the DMON acoustic monitoring instrument was developed by WHOI engineers Mark Johnson and Tom Hurst; and Baumgartner, who has nearly a decade of experience identifying whale calls, wrote software for the DMON to enable it to recognize unique calls of sei, fin, humpback, and right whales, and to keep a tally of when and where it heard each call. By integrating the DMON into Fratantoni's gliders, the team had the ability to search large areas of the ocean and to receive data in real time.

"No one of us could've done this project alone. But by teaming up, we created a really nice group of people with expertise that was tailor made for this problem," says Baumgartner. "Now, we can know that there's an animal in a particular part of the ocean within hours of a call being made, as opposed to months later," when the instruments have finally been retrieved and the data has been reviewed.

Gliders -- approx. six-foot-long, torpedo-shaped autonomous vehicles with short wings -- have been in use by oceanographers for about a decade. They move up, down, and laterally in a sawtooth pattern through the water by changing their buoyancy and using their wings to provide lift. Battery powered and exceptionally quiet in the water, the gliders are equipped with an underwater microphone on the underside of the vehicle near its wings, and an iridium satellite antenna on the tail section. The vehicle surfaces every few hours to get a GPS position and transmit data to shore-side computers.

The DMON -- a circuit board and battery about the size of an iPhone -- sits inside the glider recording audio and generating spectrograms, a form of the audio that facilitates complex sound analysis. From the spectrogram, Baumgartner's software generates a "pitch track," a visual representation of a whale call, and estimates which species

of whale made the call based on characteristics of the pitch track. Tallies of each species' detected calls and even a small subset of detected pitch tracks can be transmitted to shore by the vehicle. "Each pitch track takes less than 100 bytes, whereas transmitting just one of those calls as an audio clip would take about 8000 bytes of data," says Baumgartner. This makes the system efficient and economical. And, adds Baumgartner, it's also really flexible. It is easy to update the software to include a larger repertoire of whale calls into the software's "call library."

In addition to demonstrating the utility of the robots for the management and conservation of baleen whales, the project also has ongoing scientific objectives. One goal of the shipboard research team, in addition to spotting the whales, was to take measurements and collect biological samples of the tiny crustaceans or zooplankton upon which the whales feed, in an effort to characterize the oceanic conditions and to understand how those conditions impact the whale's food and ultimately attracts whales to the study area. "Untangling how that happens is a big deal," says Fratantoni.

"We wanted to figure out what right whales were feeding on in this area," says Baumgartner. "We took profiles of the temperature and the salinity of the water and sampled zooplankton throughout the water column to understand what might make this area attractive to right whales." Analysis of these data is in progress now.

Additional team members included representatives from the New England Aquarium who maintain a catalog of right whales and are experts in identifying individual right whales from patches of thickened skin on their heads, called callosities. Through their efforts, the team recognized four of the individual whales sighted during their week on the research ship -- two males born in 2006, one male born in 2004, and one female born in 2008.

Paleontologists who examined a new fossil found in southern California have thrown doubt on earlier claims that a "killer walrus" once existed. (Credit: Copyright Robert W. Boessenecker)

New Research Throws Doubt On Earlier 'Killer Walrus' Claims

From Science Daily
Published: 1/16/13

Paleontologists who examined a new fossil found in southern California have thrown doubt on earlier claims that a "killer walrus" once existed.

A University of Otago geology PhD student Robert Boessenecker and co-author Morgan Churchill from the University of Wyoming have just published their paper about the fossil in the online scientific journal PLOS One.

The paper reports that the new fossil-find, of the extinct walrus Pelagiarctos from southern California, prompts a different hypothesis to an earlier one that a "killer walrus" existed, preying on other marine mammals and/or birds.

Fossils of the walrus were originally found in the 1980s. The large, robust size of the jaw bone, along with the sharp pointed cusps of the teeth similar to modern bone-cracking carnivores like hyenas, suggested that Pelagiarctos fed upon other marine mammals rather than the typical diet of fish as in modern walruses.

However the new fossil, a lower jaw with teeth, and more complete than the original fossil, suggests to the Otago and Wyoming paleontologists that the Pelagiarctos was more of a fish eater as it lacked adaptations for being a "killer walrus."

The evidence pointed to the tooth shape being unlikely to have been adapted for feeding upon large prey; instead it was an example of primitively retained tooth shape.

"This new find indicates that this enigmatic walrus would have appeared similar in life to modern sea lions, with a deep snout and large canines," says Mr Boessenecker. The researchers estimated Pelagiarctos to be similar in size to some modern male sea lions (about 350 kg or 770 lbs).

"However, modern pinnipeds (seals, sea lions, and walruses) of small and large body sizes are dietary generalists, and tend to have diets rich in fish -- including sea lions similar in body size to Pelagiarctos, which means that its large body size alone doesn't make Pelagiarctos an apex predator."

The new study also analysed the evolutionary relationships of Pelagiarctos for the first time, and found it to be an early sea lion-like walrus that was most closely related to another sea lion-like walrus, Imagotaria downsi, also from California.

The study was supported by a University of Otago Doctoral Scholarship, and grants from the Geological Society of America, The Paleontological Society, and a National Science Foundation EAPSI Fellowship.

PACIFIC BLUEFIN TUNA POPULATION IS 'FRACTION OF ITS 1950S SIZE'

By Bernadette Carreon
Published: 1/31/13

[PALAU] The population of the highly-prized Pacific bluefin tuna has dropped by more than 96 per cent from its estimated level in the 1950s before large scale commercial fishing began and it is unlikely to recover if fishing continues at its current intensity, according to a stock assessment.

The summary of the latest stock assessment report of the fish was released by the International Scientific Community (ISC) for Tuna and Tuna-like Species in the North Pacific Ocean on early this month (8 January).

The study analyzed catch data from 1952 to 2011, using these to model the size of the current population and how it has changed over time.

Based on the estimates, the Pacific bluefin tuna population is in serious decline because of overfishing and its population is just a fraction of what it used to be. The assessment warns that the population could crash if commercial fishing is not drastically reduced and points out that fishers are now catching mostly juvenile fish.

Gabriel Vianna, a marine researcher at the Australian Institute of Marine Science, says that the practice of excessive fishing and catching juveniles is unsustainable and that there is in an urgent need for better management.

But Sarah Shoffler, a fishery biologist from the National Oceanic and Atmospheric Administration (NOAA), United States, says that there is no solid evidence that there has been a sharp recent fall in the number of Pacific blue fin tuna that survive to maturity.

"While we are very concerned about the population, the NOAA fisheries scientists who worked on the assessment did not determine if the population is near extinction," Shoffler tells SciDev.Net.

But she says it is clear that the total weight of fish that are at a reproductive age is at or near its lowest level.

US-based campaign organization the Pew Environment Group says that measures to ensure this happens must include science-based catch limits and major cuts in juvenile bluefin catches by implementing minimum size limits across the Pacific Ocean and banning fishing in the spawning grounds. Robust monitoring and enforcement measures must also be implemented, it says.

At the last meeting of the Western and Central Pacific Fisheries Commission in December, member countries were unable to reach a consensus to limit overall catches of tuna species, particularly the big eye, and failed to ensure the long-term sustainability of the fishery.

Meanwhile, at its June meeting, sister organization the Inter-American Tropical Tuna Commission adopted the first catch limits for Pacific bluefin tuna in the eastern Pacific. This conservation measure led to the fishery's early shutdown when the limit was exceeded in August.

The full assessment report will be released in late February.

INTO THE BLUE SERENGETI

By Cheryl Lyn Dybas

"The dugout canoe does not know the depth of the water" (*Umubindi ushira uvimye*). So say the Hangaza, a group of more than 150,000 people who live along Lake Victoria, west of Tanzania's Serengeti National Park. The proverb rings true: floating on the water won't tell you what is going on below. Half a world away from Tanzania, along the United States West Coast, oceanographers are finding new ways of looking beneath research vessels that ply the Pacific. They're getting a fish's eye view of the deep by placing electronic tags on predators such as blue whales and California sea lions, yellowfin tuna and white sharks. As the data come in, their thoughts turn to the Serengeti.

Their project is called Tagging of Pacific Ocean Predators (TOPP). It focuses on certain areas of the Pacific, among them the California Current, an undersea river of water that flows south along the western coast of North America, beginning off British Columbia and ending near Baja California. The current supports large populations of whales and seabirds, and fuels important fisheries. Its productivity comes from an upwelling of cold subsurface waters, caused by prevailing northeasterly winds. The chilly waters ferry a steady supply of nutrients to the surface. The scientists are also studying an area called the North Pacific Transition Zone, the boundary between cold subarctic water and warm subtropical water, about halfway between Hawaii and Alaska. It's a major trans-Pacific corridor for the movements of predators and prey.

"These are the oceanic areas where food is most abundant," says marine scientist Barbara A. Block of Stanford University's Hopkins Marine Station in Pacific Grove, California. "They're the savanna grasslands of the sea." Knowing where and when species migrate is critical information for managing and protecting ecosystems, says biologist Daniel P. Costa of the University of California, Santa Cruz. TOPP was launched in 2000 by Block and Costa along with Steven J. Bograd of the National Oceanic and Atmospheric Administration's Southwest Fisheries Science Center in La Jolla, Randall E. Kochevar of Stanford, and others. The project was part of the Census of Marine Life, a ten-year-long investigation of the diversity, distribution, and abundance of ocean species. TOPP became the world's largest "biologging" (electronic tagging) study, involving more than seventy-five biologists, oceanographers, engineers, and computer scientists in eight countries. A decade of findings were reported in the journal *Nature* in June 2011. They reveal that the migrations of twenty-two marine species overlap.

"It's been like looking across the entire African savanna," says Block, "and trying to figure out: Where are the watering holes a zebra or a cheetah might frequent? Where are the fertile valleys? Where are the deserts that animals might avoid, and the migratory corridors species such as wildebeest use to travel from place to place?"

Block, Costa, and their colleagues use an array of technologies to track species and to record such environmental variables as water temperature, salinity, and depth. The TOPP project alone deployed 4,306 satellite-monitored tags, yielding a massive amount of data. Scientists spent two years synthesizing data sets. They discovered intersecting ocean hotspots and highways of life—and learned much about how marine conditions influence where animals hang out.

The results show that many migratory marine species, like animals on the Serengeti grasslands, return to the same regions each year, homing in with astonishing fidelity to the places where they were first tagged. "It's akin to a student from London studying in far-off Rome and coming home each summer at the same moment—but doing it all in the dark without a map or compass, using only his or her internal sense of position and direction," says Costa.

Leatherback sea turtles, for example, travel huge distances between their nesting and feeding sites. In the Pacific Ocean, contingents from two populations of leatherbacks make their way each year to beaches along the eastern and western Pacific, respectively, to lay eggs. (An individual female will nest once every two or three years.) Helen Bailey of the University of Maryland Center for Environmental Science placed tracking devices on 135 leatherbacks' shells. Leatherback turtles in the eastern Pacific were tagged at their nesting sites in Costa Rica and Mexico; western Pacific turtles were tagged at nesting sites in Indonesia and on their foraging grounds off the coast of California. The instruments transmitted satellite signals each time the turtles surfaced.

The results of Bailey's study were published in the April 2012 issue of *Ecological Applications*. The western Pacific turtles traveled to feeding sites in the South China Sea, Indonesian seas, southeastern Australia, and the U.S. West Coast. "This wide dispersal," says Bailey, "allows for a greater likelihood of finding food. It also means that the turtles are more vulnerable to being snagged unintentionally in fishing gear."

The eastern Pacific leatherbacks have a different migration pattern, traveling south from nesting sites in Mexico and Costa Rica to the southeast Pacific. The turtles feed in offshore upwelling areas where their meals, almost exclusively jellyfish, are easy catches. "The limited feeding grounds of the east Pacific turtles make them vulnerable to changes that might occur in the abundance of jellyfish," says Bailey. "Being caught in fishing gear also poses a greater risk to this population because it has a smaller range than western Pacific leatherbacks." Entanglement in fishing gear is believed to be a major cause of death in leatherback sea turtles. James R. Spotila of Drexel University, a co-author of the paper, notes that leatherback turtles are long-lived animals that take a long time to reach maturity. Because the species' numbers are declining very fast, he considers it critical to take measures so they don't go extinct. In the past thirty years, leatherback numbers in the eastern Pacific have dropped by 90 percent. Information on the turtles' movements will help scientists determine where fishing should be limited at certain times of the year, says Bailey. A good precedent is a decision made in 2010 to close a swordfish and thresher shark fishery off California from mid-August to mid-November. That may have dramatically reduced incidental leatherback catches.

To read more, visit: http://www.naturalhistorymag.com/features/242338/into-the-blue-serengeti

Photo by Mike Johnson

SIGHTINGS Compiled by Monterey Bay Whale Watch.
For Complete listing and updates see gowhales.com/sighting

Date	#	Type of Animal(s)
2/5 a.m.	4	Gray Whales
	1	Blue Whale
	400	Long-beaked Common Dol phins
2/4 p.m.	15	Gray Whales
	400	Long-beaked Common Dol phins
2/4 a.m.	13	Gray Whales
	400	Long-beaked Common Dol phins
2/2 p.m.	6	Gray Whales
	600	Long-beaked Common Dol phins
2/2 a.m.	7	Gray Whales
2/2 early a.m.	3	Gray Whales
	60	Risso's Dolphins
2/1 a.m.	14	Gray Whales
1/31 p.m.	9	Gray Whales
	400	Pacific White-sided Dolphins
1/31 a.m.	6	Gray Whales
	75	Long-beaked Common Dol phins
1/30 a.m.	6	Gray Whales
	300	Long-beaked Common Dol phins
	45	Risso's Dolphins
1/26 a.m.	2	Gray Whales
1/25 a.m.	6	Gray Whales
	50	Risso's Dolphins
1/24 a.m.	11	Gray Whales
	6	Pacific White-sided Dolphins
	12	Risso's Dolphins
1/23 p.m.	28	Gray Whales
	100	Long-beaked Common Dol phins
	50	Risso's Dolphins
1/23 a.m.	13	Gray Whales
	200	Long-beaked Common Dol phins
	60	Risso's Dolphins
1/22 p.m.	20	Gray Whales
	60	Long-beaked Common Dol phins
1/22 a.m.	19	Gray Whales
	60	Long-beaked Common Dol phins
1/21 p.m.	2	Gray Whales
	2	Killer Whales (transient type - Stubby & Fat Fin)
	1	Blue Whale
	150	Risso's Dolphins
1/21 a.m.	22	Gray Whales
	1	Killer Whale (transient type - George=CA65)
	220	Risso's Dolphins
1/20 p.m.	27	Gray Whales
1/20 a.m.	26	Gray Whales
1/20 early a.m.	20	Gray Whales
1/19 p.m.	32	Gray Whales
	2	Killer Whales (Stubby & Fat Fin)
	35	Risso's Dolphins
1/19 a.m.	27	Gray Whales
	250	Risso's Dolphins
1/19 early a.m.	21	Gray Whales
	200	Risso's Dolphins
1/18 p.m.	35	Gray Whales
1/18 a.m.	20	Gray Whales
1/17 p.m.	40	Gray Whales
	30	Risso's Dolphins
1/17 a.m.	38	Gray Whales
1/16 a.m.	15	Gray Whales
	12	Long-beaked & Short-beaked Common Dolphins
1/15 p.m.	2	Killer Whales
	100	Long-beaked Common Dol phins
1/15 a.m.	19	Gray Whales
	20	Risso's Dolphins
1/13 p.m.	10	Gray Whales
	15	Risso's Dolphins
1/13 a.m.	31	Gray Whales
	10	Risso's Dolphins
1/12 p.m.	5	Killer Whales (same whales, still very active)
1/12 a.m.	5	Gray Whales
	5	Killer Whales (very active, breaching & hunting, with juveniles learning to hunt prey)
1/12 early a.m.	2	Gray Whales
1/8 a.m.	15	Gray Whales
	20	Risso's Dolphins
1/7 p.m.	16	Gray Whales
	20	Risso's Dolphins
1/7 a.m.	20	Gray Whales
	20	Pacific White-sided Dolphins
	300	Risso's Dolphins (including calves)
1/6 a.m.	5	Gray Whales
	25	Pacific White-sided Dolphins
	300	Risso's Dolphins
1/5 p.m.	20	Gray Whales (1 breaching)
1/5 a.m.	23	Gray Whales
	100	Pacific White-sided Dolphins
	5	Northern Right Whale Dolp hins
1/4 p.m.	9	Gray Whales
	50	Risso's Dolphins
1/4 a.m.	12	Gray Whales
1/3 p.m.	10	Gray Whales
	50	Pacific White-sided Dolphins
	200	Risso's Dolphins

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