**Soundings**

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

**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

**MEETING DATE:**
Thursday, October 29, 2015
**Time:** 7:30 PM

**Please join us at 7:00 for refreshments**

**Speaker:** Dr. Lei Lani Stelle
University of Redlands Associate Professor of Biology and Earthwatch Researcher

**Topic:** How citizen scientists contribute to research and conservation of marine mammals

Dr. Lei Lani Stelle, who leads studies of whales and dolphins off Southern California with her students and Earthwatch volunteers, will be our speaker at the October meeting. Her recent research has been focused on human impacts on marine mammals.

Dr. Stelle incorporates citizen science into the effort in order to expand the monitoring of distribution, behavior and physiology of local cetaceans and pinnipeds. She initiated and co-developed *Whale mApp*, a GIS-based web and mobile tool to encourage public reports of animal sightings. The GIS maps display the sightings and help model the habitat and determine human disturbances.

She has been working with marine mammals since she was an undergraduate in marine biology at UC Santa Cruz. She went on to study the biomechanics of swimming in Steller sea lions and earned her master’s from the University of British Columbia, then her doctorate from UCLA where she investigated the foraging ecology of gray whales.

**Please join** us for refreshments before the program begins. More information is available on our website, www.acsmb.org.

**Next program:** Our November and December meetings are combined because of the seasonal holidays, so our final program this year will be on Thursday, Dec. 10. Our speaker will be Jim Sumich, noted gray whale researcher and author of the new *The Gray Whale Book*. 
CALENDAR

Oct. 15: Ken Norris Memorial Lecture Series: Disturbing Trends-Encouraging Signs. Three scientist share their investigations of troubling trends in our modern ocean. 7:00-8:30 PM at the Seymour Center in Santa Cruz. For more information go to seymourcenter.ucsc.edu.

Nov. 5-8: Western Society of Naturalists, 96th Annual Meeting. Doubletree Hotel in Sacramento, CA. For a full line up of speakers and field trips go to wsn-online.org.

Nov. 15: True Predators: A Real Understanding of White Sharks of California. Lecture by Taylor Chapple, Research Scientist, Hopkins Marine Station of Stanford University. Taylor will share the science of white sharks of the California Coast. 1:00 -2:00 PM at the Seymour Center in Santa Cruz.

Dec. 13-18: 21st Biennial Conference on the Biology of Marine Mammals: Bridging the Past Toward the Future. Hilton San Francisco, Union Square. San Francisco, and the greater central California coast region, is home to one of the greatest diversity of marine mammals in the world, with over 30 species having been observed. It also hosts one of the greatest assemblages of marine mammal scientists and marine science institutions in the world. Upwards of 3,000 scientists from more than 30 countries are expected to attend.

BOOK RECOMMENDATIONS


TO BREATHE OR TO EAT: BLUE WHALES FORAGE EFFICIENTLY TO MAINTAIN MASSIVE BODY SIZE

Oct. 2, 2015 — As the largest animals to have ever lived on Earth, blue whales maintain their enormous body size through efficient foraging strategies that optimize the energy they gain from the krill they eat, while also conserving oxygen when diving and holding their breath, a new study has found.

Large, filter-feeding whales have long been thought of as indiscriminate grazers that gradually consume copious amounts of tiny krill throughout the day -- regardless of how prey is distributed in the ocean. But tagged blue whales in the new study revealed sophisticated foraging behavior that targets the densest, highest-quality pretty, maximizing their energy gain.

Understanding blue whale feeding behavior will help inform protections for the endangered species and its recovery needs, the scientists say. The study, by researchers from NOAA Fisheries, Oregon State University and Stanford University, was published this week in Science Advances.

"For blue whales, one of our main questions has been: How do they eat efficiently to support that massive body size," said Elliott Hazen, a research ecologist with NOAA Fisheries' Southwest Fisheries Science Center and lead author of the research. "Now we know that optimizing their feeding behavior is another specialization that makes the most of the food available."

Adult blue whales can grow to the length of a basketball court and weigh as much as 25 large elephants combined, but they operate on an "energetic knife-edge," the researchers point out. They feed through the extreme mechanism of engulfing as much prey-laden water as they weigh and then filtering out the tiny krill it contains.

But feeding expends tremendous amounts of energy and the dense krill patches they need to replenish that energy are often deep and difficult to find.

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In their study, the researchers compared the foraging of 14 tagged blue whales to 41 previously tagged blue whales off the coast of California, combining the data with acoustic surveys that measured the density of their sole prey, krill -- tiny (less than one inch) crustaceans found throughout the world's oceans.

The researchers found that when the krill were spread out, or less dense, blue whales fed infrequently to conserve their oxygen and energy use for future dives. When krill density increased, they began "lunge-feeding" more frequently, consuming more per dive to obtain as much energy from the krill as possible.

"Blue whales don't live in a world of excess and the decisions these animals make are critical to their survival," said Ari Friedlaender, a principal investigator with the Marine Mammal Institute at Oregon State University's Hatfield Marine Science Center and co-author on the study. "If you stick your hand into a full bag of pretzels, you're likely to grab more than if you put your hand into a bag that only had a few pretzels."

The feeding pattern that focuses more effort on the densest krill patches provides a new example of blue whale foraging specializations that support the animals' tremendous size.

This kind of lunge-feeding takes a lot more effort, but "the increase in the amount of energy they get from increased krill consumption more than makes up for it," noted Jeremy Goldbogen, a marine biologist from Stanford University and co-author on the study. "Lunge-feeding is a unique form of 'ram-feeding' that involves acceleration to high speed and the engulfment of large volumes of prey-laden water, which they filter," Goldbogen noted. "But we now know they don't take in that water indiscriminately. They have a strategy that aims to focus feeding effort on the densest, highest-quality krill patches."

In their study, the researchers found a threshold for krill that determined how intensively the blue whales fed.

"The magic number for krill seems to be about 100 to 200 individuals in a cubic meter of water," Hazen said. "If it's below that range, blue whales use a strategy to conserve oxygen and feed less frequently. If it's above that, they'll feed at very high rates and invest more effort."

The researchers say this insight into blue whale feeding will help determine how best to protect the species, which is listed as endangered by the International Union for Conservation of Nature.

"If they are disturbed during the intense, deep-water feeding, it may not have consequences today, or this week, but it could over a period of months," Friedlaender said. "There can be impacts on their overall health, as well as on their fitness and viability for reproduction."

The study was funded by the U.S. Office of Naval Research.

http://www.sciencedaily.com/releases/2015/10/151002144859.htm

NEW FOSSILS INTENSIFY MYSTERY OF SHORT-LIVED, TOOTHY MAMMAL FOUND IN ANCIENT NORTH PACIFIC

Oct. 6, 2015 — The identification of a new species belonging to the marine mammal group Desmostyli has intensified the rare animal's brief mysterious journey through prehistoric time, finds a new study.

A big, hippo-sized animal with a long snout and tusks -- the new species, 23 million years old, has a unique tooth and jaw structure that indicates it was not only a vegetarian, but literally sucked vegetation from shorelines like a vacuum cleaner, said vertebrate paleontologist and study co-author Louis L. Jacobs, Southern Methodist University, Dallas.

But unlike other marine mammals alive today -- such as whales, seals and sea cows -- desmostylians went totally extinct. Desmostylians, every single species combined, lived in an interval between 33 million and 10 million years ago.

Their strange columnar teeth and odd style of eating don't occur in any other mammal, The new specimens -- from at least four individuals -- were recovered from Unalaska, an Aleutian island in the North Pacific.

While alive, the creatures lived in what is now Unalaska's Dutch Harbor, where fishing boats depart on Discovery channel's "Deadliest Catch" reality TV show.

"The new animal -- when compared to one of a different species from Japan -- made us realize that desmos do not chew like any other animal," said Jacobs, a professor of earth sciences. "They clench their teeth, root up plants and suck them in."

To eat, the animals buttressed their lower jaw with their teeth against the upper jaw, and used the powerful muscles that attached there, along with the shape of the roof of their mouth, to suction-feed vegetation from coastal bottoms. Big muscles in the neck would help to power their tusks, and big muscles in the throat would help with suction.
"No other mammal eats like that," Jacobs said. "The enamel rings on the teeth show wear and polish, but they don't reveal consistent patterns related to habitual chewing motions."

The new specimens also represent a new genus -- meaning desmostylians in the same family diverged from one another in key physical characteristics, particularly the tooth and jaw structure, said Jacobs, who is one of 10 scientists collaborating on the research.

Discovery of a new genus and species indicates the desmostylian group was a successful group that was larger and more diverse than previously known, said paleontologist and co-author Anthony Fiorillo, vice president of research and collections and chief curator at the Perot Museum of Nature and Science, Dallas, and an adjunct research professor at SMU.

"Our new study shows that though this group of strange and extinct mammals was short-lived, it was a successful group with greater biodiversity than had been previously realized," said Fiorillo.

Unique from other marine mammals in their diet, eating, lifespan

A large, stocky-limbed mammal, desmos' modern relatives remain a mystery. They've been linked previously to manatees, horses and elephants.

Compared to other mammals, desmos were latecomers and didn't appear on earth until fairly recently -- 33 million years ago. Also unusual for mammals, they survived a mere 23 million years, dying out 10 million years ago.

Unlike whales and seals, but like manatees, desmos were vegetarians. They rooted around coastlines, ripping up vegetation, such as marine algae, sea grass and other near-shore plants.

They probably swam like polar bears, using their strong front limbs to power along, Jacobs said. They walked on land a bit, lumbering like a sloth.

Adult desmostylians were large enough to be relatively safe from predators.

The authors report their discoveries in a special volume of the international paleobiology journal, *Historical Biology*.

The research was funded by the Perot Museum of Nature and Science, U.S. National Park Service -- Alaska Region Office, and SMU's Institute for the Study of Earth and Man.

**Home was the North Pacific, on wave-battered "Deadliest Catch" island**

The newest desmo made its home on Unalaska Island, the farthest north of any occurrence of the group, which only lived along the shores of the North Pacific.

"That's the only place they're known in the world -- from Baja, California, up along the west coast of North America, around the Alaska Peninsula, the storm-battered Aleutian Islands, to Russia's Kamchatka Peninsula and Sakhalin Island, to the Japanese islands," Jacobs said.

The Unalaska fossils represent at least four individuals, and one is a baby.

"The baby tells us they had a breeding population up there," Jacobs said. "They must have stayed in sheltered areas to protect the young from surf and currents."

In addition, "the baby also tells us that this area along the Alaska coast was biologically productive enough to make it a good place for raising a family," said Fiorillo.

Just as cattle assemble in a herd, and a group of fish is a school, multiple desmostylians constitute a "troll" -- a designation selected by Jacobs to honor Alaskan Ray Troll, the artist who has depicted desmos most.

To make the Unalaska and Japanese specimens readily available to scientists anywhere in the world, each fossil was modeled as a 3-D image to reconstruct the skull and provide interactive animations of the fossils, said Michael J. Polcyn, research associate and director of SMU's Digital Earth Sciences Laboratory.

**Journey from the land to the ocean to a quarry**
The first Unalaska fossils were discovered in the 1950s in a rock quarry during U.S. Geological Survey mapping. Others found more recently were on display at the Ounalashka Corporation headquarters. Those specimens were offered to Fiorillo and Jacobs for study after Fiorillo gave a public presentation to the community on his work in Alaska.

"The fruits of that lecture were that it started the networking with the community, which in turn led us to a small, but very important collection of fossils that had been unearthed in the town when they built a school a few years earlier," Fiorillo said. "The fossils were shipped to the Perot Museum of Nature and Science for preparation in our lab and those fossils are the basis for our work now."

From there, the researchers discovered that the fossils were a new genus and species.

The researchers named the new mammal Ounalashkastylus tomidai. "Ounalashka," means "near the peninsula" in the Aleut language of the indigenous people of the Aleutian Islands.

"Stylus" is from the Latin for "column" and refers to the shape of cusps in the teeth.

"Tomida" honors distinguished Japanese vertebrate paleontologist Yukimitsu Tomida.

The article appears in a special volume of Historical Biology to honor the career accomplishments of Tomida upon his retirement from the Department of Geology and Paleontology in Tokyo's National Museum of Nature and Science.

http://www.sciencedaily.com/releases/2015/10/151006102733.htm

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**WHALE FOSSIL DISCOVERED IN SANTA CRUZ MOUNTAINS**

*By Joseph Scalise*

Sep. 23, 2015 — A construction project in California has led to the discovery of an ancient whale fossil at the site, according to a report in the Santa Cruz Sentinel.

The large bones were first found earlier this month in Scotts Valley, California, a community tucked away in the Santa Cruz Mountains. In order to properly excavate the find, a team of experts from the company Paleo Solutions was called up from Los Angeles County. The official excavation began on September 17th. The team used shall shovels, brooms and hand tools to take the bones from the earth.

Due to the softness of whale bones, they could not separate them from the rock. Rather, they dug around the skeleton and then encased it in plaster. This allowed the fossil to be transported to a lab where workers can more closely work on chiseling the rock away from the bones.

According to Christian Science Monitor, many of the paleontologists on the project were pleased that most of fossil was found intact. In all they discovered a jaw, skull, shoulder blades, arm bones, and vertebrae.

"I think of the fossils you get along the coastline, it's more common to get a piece of the skull or the brain case or some bones," Matthew Clapham, a paleontologist at the University of California-Santa Cruz, told the Sentinel, "So this sounds like a very impressive find."

Though it may seem strange to find a marine mammal fossil up in the mountains, there is an explanation. California is covered in fault lines, which constantly shift the earth. The shifting then raises the ground. After thousands and thousands of years, that process can raise the sea bed into mountains.

The fossil itself measures around 25 feet in length. Though scientists estimate it could be around 4 million years old, they are not sure what species it belonged to. However, early guesses are that it is a mysticete whale, an ancient ancestor of the baleen whale.


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**LANDMARK NEW RULES TO PROTECT CALIFORNIA’S WHALES, DOLPHINS AND SEA TURTLES FROM THE DRIFT GILLNET FISHERY**

American Cetacean Society – Monterey Bay

www.acsmb.org
The Pacific Fisheries Management Council (PFMC) adopted a strict new rule for California’s drift gillnet fishery to protect nine vulnerable marine species. The rule will institute new “hard caps” that can automatically shut the fishery down if hard limits are reached in any two-year period, reflecting a new no-nonsense approach to dealing with ongoing damage to rare and threatened species, including sperm whales, humpback whales, fin whales, green sea turtles, leatherback sea turtles, loggerhead sea turtles, olive ridley sea turtles, pilot whales and bottle nosed dolphins. In addition, the PFMC also instituted new performance standards for discards.

The Council’s actions come after Turtle Island Restoration Network delivered over 11,000 petitions in support of stronger protections for endangered marine wildlife, gave direct public testimony and submitted a range of letters, scientific analyses, calls for action from the scientific community, including faculty from Stanford University and five of the University of California campuses.

The new rules represent a significant step forward and an important interim measure toward shutting down the use of drift gill nets permanently. Drift gillnets used to catch swordfish tangle and kill many other marine animals wherever they are used, including off California’s coast, and must ultimately be replaced with cleaner fishing gear. These drift gillnets discard, on average, over 60 percent of their catch, and threaten a wide array of endangered, vulnerable, and rare sea turtles, marlins, sharks, dolphins, whales, seals, ocean sunfish, and dozens of other species. The vast majority of air breathing marine animals drown and die when captured by these nets, contributing to the steep declines in the populations of many of these species.

These nets have been banned in all other U.S. states and many counties internationally, including most recently Russia, which banned drift gill nets earlier this year. Only California retains their use in the U.S.

“The California drift gillnet fishery is among the world’s most destructive fisheries and it is past time we moved away from this destructive gear,” said Doug Karpa of Turtle Island Restoration Network. “The PFMC has taken a major step forward toward reining in this destructive gear, but it is time to recognize that ultimately drift gill nets are an archaic gear that cannot be part of any future sustainable fishery.”

“These hard caps should only be used as an interim measure until the Council officially outlaws deadly drift gillnets,” said Joanna Nasar, communications director of Turtle Island Restoration Network. “The continued survival of many vulnerable species of whales, turtles and sharks and the biodiversity of our marine wildlife depends on closing this fishery.”


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The Search for Wandering Albatross

By David O’Shea

Oct. 8, 2015 — Once a month, a group of volunteers led by ornithologist Lindsay Smith heads out to the continental shelf in the Southern Ocean, off the New South Wales coast, to tag albatross.

Mr. Smith has dedicated his life to albatross research and the Southern Ocean Seabird Study has been running since 1956, making it the longest continuous seabird study in the world.

But the wandering albatross is in serious decline. Mr. Smith says the situation is critical and he fears they will die out.

He blames long line industrial fishing operators who set lines that run for kilometers, sometimes carrying thousands of hooks. The wandering albatross become by-catch.

“Ten years ago you could have 30 wandering albatrosses around the boat. In this day and age we’ll be lucky if we see any.” (Credit: Lindsay Smith).
SIGHTINGS

Sightings are compiled by Monterey Bay Whale Watch. For complete listing and updates see http://www.montereybaywhalewatch.com/slstcurr.htm

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“...The rate at which the birds are dying is greater than the rate that they can breed. They don't breed until they are 10-20 years of age. They can only breed once every two years because it takes 11 months for them to raise a chick. The population has been in serious decline since the '60s when long line fishing started up. If it's not the long line fishing, then it's feral animals on their breeding grounds - rats and mice eating the chicks. The decline that I have noticed in my lifetime indicates to me that within the next 50 years wandering albatrosses will become that rare that you will be lucky to see one. (Credit: Lindsay Smith).

American Cetacean Society
Monterey Bay Chapter
P.O. Box H E
Pacific Grove, CA 93950

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