Soundings AMERICAN CETACEAN SOCIETY

American Cetacean Society – Monterey Bay Chapter PO Box HE, 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

Thursday, March 28, 2019 Time: 7:30 PM

Speaker: Nancy Black

Nancy Black is a marine biologist who received an M.S. in Marine Science from Moss Landing Marine Laboratories and has owned and run Monterey Bay Whale Watch since 1992. She worked as a research director for the Oceanic Society on a population of spotted dolphins in the Bahamas, and on a program in Monterey Bay to conduct research on large baleen whales and dolphins during the 90's. Nancy worked with NOAA and the Seattle Marine Mammal Laboratory for 12 seasons to research Killer Whales throughout Alaska, including the Aleutian Island chain. Nancy has contributed data and photo IDs of Humpback Whales and Blue Whales in Monterey Bay for Cascadia Research for over thirty years, and conducted aerial surveys for several years in offshore waters along the Central Coast. She has worked with many film crews over the years, including Blue Planet 1, where she assisted with the first professional filming event of the predation of Killer Whales on Gray Whales, a National Geographic film focused on Killer Whales of Monterey Bay and advised filming on her boats for Blue Planet 2, PBS shows, and Animal Planet.

Nancy began her interest and research on Killer Whales as a student in the late 80's. She continues to follow the Killer Whale population that is unpredictably sighted in Monterey Bay, ranging from southern California to Southeast Alaska, and has documented four generations of Killer Whales living in their matriarchal societies. Nancy was the first to document the very high levels of chemical pollutants (PCBs, DDTs) in these whales by collecting small samples of skin and blubber under permit. She has documented four different eco-types of Killer Whales in Monterey Bay, including discovering and identifying the endangered Southern Resident Whales in Monterey for the first time in 2000. Her passion for these highly intelligent and social animals that live and hunt in family groups has continued, and she spends most days at sea during the peak time for transient Orca sightings in Monterey Bay in April and May. Nancy will give highlights of her experiences and observations with Killer Whales in Monterey Bay, including associations, movements, predation behavior and social behavior.

Next month: Our next meeting will be on Thursday, April 25 at Hopkins Marine Station. Our speaker will be Jason Colby, speaking about Southern Resident Killer Whales. Please save the date and join us! More information is available on our website, www.acsmb.org.

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Monterey Bay Chapter

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ACS Monterey Bay chapter needs you!

Please consider volunteering to serve on the ACS Board of **Directors.** Current openings include Membership Chair and Publicity Chair.

If you enjoy learning about whales and sharing your passion with others, we'd like to speak with you. Please contact any board member for more information.

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CALENDAR

Now through March 17: Exhibit at the Oakland Museum of California: "Cruisin' the Fossil Coastline: The Art of Ray Troll and the Paleontology of Kirk Johnson"

Now though Apr. 14: Exhibit at the Pacific Grove Museum Of Natural History: Magnificent Migrations: A Journey Through Central California.

Now through Nov. 22: Albatross Exhibit at the Seymour Center at Long Marine Lab: "A Perfect Day for an Albatross." Features Caren Lobel-Fried's book and artwork. The exhibit also features videos, albatross facts and hands-on activities about this remarkable seabird.

Mar. 17: Science Sunday at Long Marine Lab: Sea Star Wasting Syndrome, An Unfolding Story. Lecture by Monica Moritsch, Ph.D, Marine Ecologist at Stanford Center for Ocean Solutions. 1:30 - 2:30 PM.

Mar. 21: Hardcore Natural History Series at the PG Museum of Natural History: Unearthing the California Grizzly: Explore the natural history of the now extinct California Grizzly with Dr. Alexis M. Mychajliw of the La Brea Tar Pits. 6:30 - 8:00 PM.

Mar. 23: Global Oceans Gala Honoring John Laird at the Seymour Marine Discovery Center in Santa Cruz.

Apr. 9: Friends of Hopkins Lecture Series: "Roz Naylor. Oceans and the Future of Food." 7:30 to 8:30 PM at Hopkins Boat Works Lecture Hall.

Apr. 18: Moss Landing Marine Lab Seminar Series: Using Virtual Reality to Share the Ocean. Presented by Erika Woolsey of Stanford and The Hydrous. 4:00 to 5:00 PM in the Moss Landing Marine Labs Seminar Room.

Apr. 25: Moss Landing Marine Lab Seminar Series: Microplastics from Indonesia to San Francisco. Presented by Carolynn Box of the 5 Gyres Institute. 4:00 to 5:00 PM in the Moss Landing Marine Labs Seminar Room.

Apr. 27-28: Moss Landing Marine Lab Open House. Events include seminars by MLML researchers, tours of wetlands, birds and aquaculture facility, and fun activities for kids. 9:00 AM - 5:00 PM both days.

BOOK RECOMMENDATIONS

<u>Upheaval: Turning Points for Nations in Crisis</u>, by Jared Diamond, Pulitzer Prize wining author of Guns, Germs, and Steel and Collapse. 2019 Little, Brown and Company

Europe: A Natural History, by Tim Flannery. 2019 Atlantic Monthly Press.

Mama's Last Hug: Animal Emotions and What They Tell Us about Ourselves, by Frans De Waal. 2019 W.W. Norton & Company.

Ocean Outbreak: Confronting the Rising Tide Of Marine Disease, by Drew Harrell. 2019 University of California Press.

MIGRATING BLUE WHALES RELY ON Memory More than Environmental Cues to Find Prey

Feb. 26, 2019 — Blue whales reach their massive size by relying on their exceptional memories to find historically productive feeding sites rather than responding in real time to emerging prey patches, a new study concludes.

Researchers examining records of both whale migration and oceanic conditions in the California Current Ecosystem found that blue whales almost perfectly match the timing of their migration to the historical average timing of krill production, rather than matching the waves of krill availability in any given year.

The findings suggest that blue whales locate prey by relying on memory to return to stable, high-quality foraging sites, which historically have served them well but could make it difficult for the whales to adapt if novel ecosystem changes emerge as a result of climate change.

Results of the study are being published next week in *Proceedings of the National Academy of Sciences*.

The concept of tracking the timing of food availability along migration routes is not unusual for land animals, but it has been more difficult to identify in marine creatures, according to Briana Abrahms, a research ecologist with the NOAA Southwest Fisheries Science Center in Monterey, Calif., and lead author on the study.

"We know that many species that migrate on land, from caribou in the Arctic to wildebeests in the Serengeti, enhance their survival by carefully adjusting the pace and timing of their migrations to

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find food as it becomes seasonally available along the way, rather than just migrating to get from point A to point B," Abrahms said.

Blue whales seem to embrace that same strategy, which is enhanced by their memory, she noted. "These long-lived, highly intelligent animals are making movement decisions based on their expectations of where and when food will be available during their migrations."

"This novel study is particularly noteworthy in that if focuses on the phenology, or timing of migration in a large marine predator," said Sue Moore, an affiliate professor at the University of Washington Center for Ecosystem Sentinels, who was not involved in the study.

The study also raises the question of what will happen to the population if changing climate conditions cause food availability to deviate strongly from the whales' expectations.

The interdisciplinary research team used 10 years of tagging data from the Marine Mammal Institute at Oregon State University to determine daily blue whale movements of 60 individual whales in the California Current Ecosystem, and then compared that with satellite-based measurements of ocean productivity.

"We think that blue whales have evolved to use historical migration routes and timing that put them in proximity to the most predictably high production feeding areas and then make minor adjustments based on local conditions," said Daniel Palacios, a principal investigator with Oregon State's Marine Mammal Institute and a co-author on the study.

"There are various time scales of events that could change the timing of phytoplankton blooms -- and thus the availability of the whales' preferred prey, krill," he noted, "including La Nina and El Nino events and the Pacific Decadal Oscillation. But the whales' strategy of relying on memory and historic timing at least gets them into 'the Goldilocks zone.""

Blue whales can grow to the length of a basketball court, weigh as much as 25 large elephants, and their mouths can hold 100 people, though their diet is primarily krill -- tiny shrimp-like creatures less than two inches in length. The blue whale is thought to be the largest creature to ever inhabit the Earth, yet little was known about their range or where they went to breed until Oregon State's Bruce Mate led a series of tracking studies featured in the popular 2009 National Geographic documentary, "Kingdom of the Blue Whale."

"There is still a lot we don't know about blue whales, but it is apparent that they have strong fidelity to certain sites along the West Coast of the United



Photograph of blue whale taken during Oregon State University Marine Mammal Institutes 2016 tagging field season off southern California. (Credit: Oregon State University).

States, which they use year after year," said Mate, who directs OSU's Marine Mammal Institute.

An estimated 2,500 of the world's 10,000 blue whales spend time in the waters off the West Coast of the Americas and are known as the eastern North Pacific population. The huge whales can travel from the Gulf of Alaska all the way down to an area near the equator known as the Costa Rica Dome. The majority of the population spends the summer and fall in the waters off the U.S. West Coast, with the tagged whales most heavily using areas off Santa Barbara and San Francisco, California, which puts them in routine peril from ship strikes.

"We still have a lot to learn about how large animals navigate in the ocean, how they find good habitat and how they are affected by human activities and environmental changes," said NOAA's Abrahms.

Understanding how blue whales make movement decisions give scientists insight into how they may, or may not, be able to cope with changing ocean conditions in the future, she added.

https://www.sciencedaily.com/releases/2019/02/190226 112405.htm

15-METER-LONG ANCIENT WHALE *BASILOSAURUS ISIS* WAS TOP MARINE **PREDATOR**

Jan. 9, 2019 — The stomach contents of ancient whale *Basilosaurus isis* suggest it was an apex predator, according to a study published January 9, 2019 in the open-access journal *PLOS ONE* by Manja Voss from the Museum für Naturkunde Berlin, Germany, and colleagues.

The authors uncovered an adult *B. isis* specimen in 2010 in the Wadi Al Hitan ("Valley of Whales") site in Cairo, Egypt. This site was once a shallow sea



UM 97512, 100146, 101215, 101222) from Wadi Al Hitan, Egypt, as exhibited at the University of Michigan. Both are adult, fully grown, and illustrated at the same scale (scale bar equals 1 meter). CGM 42195 shows a cast of a 15-meter long *B*. *isis* specimen. (Credit: Voss et al., 2019; CC-BY).

during the late Eocene period and is remarkable for its wealth of marine fossils. While excavating this main *B. isis* specimen, the authors also revealed the remains of sharks, large bony fish, and, most numerously, bones from *Dorudon atrox*, a smaller species of ancient whale. The Basilosaurus skeleton was distinct from other skeletons in the cluster, containing pointed *B. isis* incisors and sharp cheek teeth as well as bones. Most of the fish, and Dorudon whale remains showed signs of breakage and bite marks, were fragmented, and tended to be clustered within the body cavity of the *B. isis*specimen.

One hypothesis to explain the clustering of these remains was that *D. atrox* had scavenged the *B. isis* carcass and fish. However, the *D. atrox* were juveniles, capable only of drinking mother's milk. Bite marks on prey skulls also indicated predation rather than scavenging, since predators commonly target the head. The authors therefore position *B. isis* as a top predator which ate its prey live, rather than by scavenging. They propose that the remains of fish and juvenile *D. atrox* in the cluster are remnants of previous *B. isis* meals, while the teeth of sharks indicate postmortem scavenging.

Voss and colleagues draw a comparison with the modern-day killer whale (*Orcinus orca*), another toothed whale apex predator which often feeds on smaller whales and frequently hunts humpback whale calves during humpback calving season. The authors hypothesize that the Wadi Al Hitan site was a whale calving site for prey whale Dorudon, making it a hunting site for top predator *B. isis* during the late Eocene.

https://www.sciencedaily.com/releases/2019/01/190109 142626.htm

JOHN CALAMBOKIDIS AWARDED Leadership in Conservation Award

Mar. 3, 2019 — John became interested in conservation and environmentalism while in high school and there started a neighborhood recycling program in the early 1970s where he and a friend would do curbside recycling pickups in their

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neighborhood. He became interested in studying biology while on a yearlong bicycle trip through Europe, the Middle East, and Africa in 1972-73 and learned about Evergreen State College while living in a cave in Greece during the trip. At Evergreen he quickly got into conducting research working with other students on a SOS (student originated studies) grant from National

Science Foundation to examine the distribution of PCBs in fish, sediment and mussels in Puget Sound. That project lead to his directing another SOS grant to study harbor seals and environmental contaminations. From then on, learning more about marine mammals was his life. After graduating from Evergreen State College, he worked on marine mammal studies in Alaska, and came back to Olympia and with several other Evergreen graduates founded Cascadia Research Collective in 1979.

At Cascadia Research, he has received grants and contracts, primarily from government agencies, to pursue research in a variety of areas that serve to promote conservation. For over 40 years, he served as Principal Investigator of more than 200 research studies on marine mammals, birds, and pollution. He has supervised staff of up to 20 researchers, authored >120 publications in scientific journals, >150 technical reports, and >175 scientific presentations. John has authored two books on marine mammals (the award-winning Guide to Marine Mammals of Greater Puget Sound from Island Publishers, with R. Osborne and E.M. Dorsey; and <u>Blue Whales</u> from Voyageur Press, with G.H. Steiger).

John enjoys teaching. In the late 1970s he taught and developed courses for the School for Field Studies including a month-long kayak-based education and research expedition in Glacier Bay studying harbor



John Calambokidis in an inflatable boat conducting offshore surveys.

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seals, harbor porpoise, and Canada geese which he lead for several summers. He has served as an Adjunct Faculty at Evergreen State College where he taught courses on Marine Mammal Biology every few years through the 1990s and 2000s. He also enjoys giving talks to both scientists, the public, and students and gives frequent presentations to colleges, scientific organizations un and down the West Coast, and national and international marine mammal organizations.

John is known for his enjoyment working in small inflatable boats far offshore and from the 1980s on he covered the US West Coast going out of almost every boat launch in California, Oregon, and Washington conducting small boat surveys sometimes more than 100 miles offshore. He is skilled at maneuvering boats around whales and photographed thousands of humpback, blue and gray whales as well collected hundreds of samples and deployed over 500 tags on wide variety of cetaceans.

He enjoyed working with his family more than anything and partnered throughout his career with his wife Gretchen Steiger and whenever possible their kids Alexei and Zoe. He received various awards through his life including a Lifetime Achievement award from the American Cetacean Society. His work has been covered on shows by National Geographic, Discovery Channel, BBC, and others.

http://www.cascadiaresearch.org/washingtonstate/john-calambokidis-awarded-leadership-conservationaward

MILITARY SONAR DISTURBS BLUE WHALES' FEEDING, RESEARCH REVEALS

by Harry Cockburn

Mar. 5, 2019 — High-intensity military sonar can have a major impact on the feeding habits of blue whales, scientists have concluded after a five-year project to track the endangered species' behavior.

The majority of whales would immediately stop feeding on deep patches of krill when they encountered sonar, and many fled the area, a research team from the University of California found.

"We wanted to understand better what the common behavioral responses are in blue whales when they are exposed to sonar," said Dr. Brandon Southall, who led the study.

The acoustic frequencies used in sonar systems vary from very low (infrasonic) to extremely high (ultrasonic). It is thought some sonar systems could interfere with sea animals' echolocation and have previously been linked with whales beaching, as well as disrupting feeding and mating. In order to record the whales' behavior, Dr. Southall and 14 colleagues embarked on a marathon tracking program to stick suction-mounted sensors onto the animals.

"The ocean is a big place and it can be easy to miss and lose even the biggest animals ever on the planet, but, because they are so large and have very tall blows, they are actually among the easiest marine mammals to track," he said.

Despite the daunting size of the creatures, Dr Southall said the scientists maneuvered to less than five meters from the whales in a small inflatable boat to attach the suction tags, which were then able to record and relay the animals' depth, movements and sounds in the water.

Once the tags were attached and six trained observers were in place to confirm the animal's movements at the surface, the team generated sonar signals from a boat located about half a mile away for between 30 minutes to an hour.

During this time, they monitored the animals' reactions, first as the sonar became louder and then after the noise ceased. They also used echosounders to track krill when conditions permitted, to get a better idea of when and where the whales were in relation to their food.

The team recorded whales' responses to 42 sonar tests over five years.

When the results were logged, statistical ecologist Stacy DeRuiter of Calvin College, Michigan, led a team analyzing the information logged by the tags, which Dr. Southall then combined with observations at the surface, to look for patterns and potential changes in the whales' behavior.

The majority of the deep-diving whales stopped feeding when the sonar signals began. In addition, some of the animals that had stopped feeding turned and headed away from the sonar emitter, although



Blue whales are the largest animals ever to have lived on Earth. (Credit: Todd Chandler).

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most resumed their activities soon after the sonar stopped.

But those whales near the surface generally didn't respond at all, even when the sonar was loud and nearby.

After the findings were published in the *Journal of Experimental Biology*, Dr. Southall admitted he was surprised by how different the whales' reactions were.

He said: "Some whales responded when the sound was barely audible, while others seemingly ignored it and kept feeding at quite loud levels."

This, he added, was a "really big deal".

"The current management approaches rely very heavily on the amplitude level to predict response', he said.

However, Dr. Southall said the activity the whale is engaged in seems to have a larger impact on the degree to which the sonar disrupts its behavior.

"Impacts could be minimized by reducing sonar disturbance during periods of blue whale foraging on deep patches of krill in the military's main training areas," he said.

https://www.independent.co.uk/news/science/bluewhales-military-sonar-feeding-a8807366.html

ORCA EXPERT RECOMMENDED ACTIONS

Mar. 5, 2019 — To the elected officials, task force members and working group members of British Columbia and Washington:

Concern for the critically endangered Southern resident killer whales is growing. If bold and immediate actions are not taken in both the United States and Canada, we face the increasing likelihood of losing this unique population forever. While we, the undersigned, appreciate the ongoing efforts and support many of the actions that are underway on both sides of the border, we feel that bigger and bolder actions are needed to give these whales a real chance at recovery. A transboundary perspective is also essential. Some of these actions have been proposed among a suite of others, and we want to highlight them as being the key actions needed going forward. Others have yet to be seriously addressed. These are the big-ticket, science-based recommendations we are making:

1. Fully fund shovel-ready salmon habitat restoration projects across British Columbia and Washington state that overlap stocks of known importance to the Southern residents. While proposed funding has increased via Washington Gov. Jay Inslee's task force and British Columbia's Coastal Restoration Fund, the proposed dollars still fell well short of requests. Many salmon runs are limited by the availability and quality of freshwater habitat, which can be enhanced by restoration. A new round of applications should be solicited to be funded in the next biennium.

2. Breach the four Lower Snake River dams. Fish passage measures have improved survival at dams, but juvenile salmon still experience mortality rates 150 percent higher than in free-flowing portions of the river. Scientists have long endorsed breaching the four Lower Snake River dams as the best action to help recover both wild salmon and Southern resident killer whales. The stakeholder panel proposed by Inslee's task force is a key step, but rather than continuing the debate, it should have the stated goal of developing an immediate mitigation package to support dam breaching.

3. Allocate a fisheries quota for the Southern residents at all levels of fisheries management on the West Coast. Many difficult conversations about fisheries management have been had. These are the only actions that will leave more fish in the water for the whales immediately. Washington's Fish and Wildlife Commission voted in January 2019 to consider the needs of Southern residents in fisheries management, but efforts need to go beyond the state level to cover the whole west coast and include a defined quota for the whales. Mixed stock oceanic fisheries are the greatest concern. Sustainable fisheries that are not limited by habitat or place-based fishing rights should also be moved to terminal river fisheries to further limit impact on the whales.

4. Replace and retrofit flood gates along the Fraser River. The Fraser River is the single most important food source for the Southern residents in the summer months. Faulty floodgates in the Fraser River valley are having harmful effects on juvenile salmon, and this issue has yet to be seriously addressed by any of the proposed Fraser River restoration projects. This issue needs to be remedied to improve juvenile salmon survival and help replenish Fraser River salmon stocks.

5. Clean up known toxic, pollutant and stormwater hotspots in Puget Sound and at the High concentrations of Fraser River delta. contaminants both kill juvenile salmonids and bioaccumulate in food-stressed Southern resident killer whales which weakens their immune systems and increases calf mortality. Widespread regional action is needed both in Puget Sound and the Fraser River delta to address point sources and stormwater We strongly support runoff. the fast-track implementation of Inslee's proposed budget to address

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runoff issues and accelerate toxic cleanup, and strongly encourage British Columbia to follow suit. There are many proposals on the table throughout the region to address the issues facing the Southern resident killer whales. As organizations dedicated to the recovery of these whales, we feel the five key actions above are essential moving forward. We ask that you keep these recommendations at the forefront when moving forward in passing legislation, forming recommendations and assigning funding.

https://www.sanjuanjournal.com/opinion/orca-expertrecommended-actions-guest-column/



Gray Whales on February 28, 2019. (Credit: Daniel Bianchetta).

SIGHTINGS

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

Date	#	Type of Animal(s)		
	15	Gray Whales		
2/28 11 am	1	Humpback Whale		
	2	Black-footed Albatross		
	14	Gray Whales (northbound)		
2/28 9 am	180	Risso's Dolphins		
	9	Black-footed Albatross		
2/27 9 am	18	Risso's Dolphins		
2/27 8 am	1	Humpback Whale (fluking)		
	35	Risso's Dolphins		
	2	Gray Whales		
2/25 9 am	1	Humpback Whale (breaching)		
	10	Northern Right Whale Dolphins		
2/24 4 mm	6	Gray Whales		
2/24 4 pm	245	Risso's Dolphins (breaching)		
2/24.11 or	5	Gray Whales		
2/24 11 alli	4	Blue Sharks		
	8	Gray Whales		
2/23 9 am	2	Humpback Whales		
All Day	4	Bottlenose Dolphins		
	100	Risso's Dolphins		
2/22.11 or	7	Gray Whales		
2/22 11 am	1	Humpback Whale		

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	1	Blue Shark		
2/22 9 am	4	Gray Whales (spouting and fluking)		
2/19 2 pm	3	Gray Whales		
2/19 9 am	5 20 1	Gray Whales Risso's Dolphins Black-footed Albatross		
2/18 2 pm	1	Elephant Seal (male)		
2/18 9 am	8	Gray Whales		
2/16 11 am Bay Cruise	1	Gray Whale		
2/12 11 am	20	Gray Whales		
2/12 9 am	6	Gray Whales		
2/11 9 am	18	Gray Whales		
2/9 11 am	8	Gray Whales (traveling and fluking)		
2/8 9 am	14 5	Gray Whales Harbor Porpoise		
2/7 9 am	16 40	Gray Whales Risso's Dolphins (nursery pod)		
2/6 3:30 pm	7	Gray Whales		
2/6 9 am	21	Gray Whales (breaching)		
	20	Risso's Dolphins		
2/1 9 am	24	Gray Whales (breaching)		
	100	Risso's Dolphins		



Risso's Dolphin breaching on February 23, 2019. (Credit: Daniel Bianchetta).

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