

"ON EFFORT" Newsletter April 2023

FROM THE HELM ...

HAPPY, HEALTHY SPRING!!!

Greetings Crew!

It's SPRING! We've been gearing up with recruiting, surveys, trainings, festivals, lectures, marine mammal symposium news, and so much more! Join us for fun, comradery and dolphins!

BIG NEWS! NAME CHANGE! No, not The Dolphin Project... the dolphins!!! Several years back I heard that the estuarine Bottlenose dolphins on the eastern seaboard would be designated as a sub-species of Bottlenose. 10 years later, it's happened! No more 'Tursiops truncates' for the Bottlenose that we study. The estuarine Bottlenose are now known as Tamanend's Bottlenose dolphins 'Tursiops erebennus'. Savannah State University Marine Mammal Department is already using this new terminology and referred to it at SEAMAMMS 2023 (SouthEast Mid-Atlantic And Marine Mammal Symposium). For more information on this go https://www.fisheries.noaa.gov/featureto: story/bottlenose-dolphins-along-east-coastproposed-be-different-species

SEAMAMMS 2023 in Mobile AL at University

of South Alabama was attended by Joni Chastain, Nicole Neininger, Scott Craig and myself. We enjoyed the presentations, meals and venue. It was a first time hosting for USA. Great job!

Another BIG NEWS ITEM from SEAMAMMS...

Bottlenose can also be identified by Bridle marks. I think of them as birthmarks. Each dolphin has unique markings. Graysen Boehning of Taras Oceanographic Foundation in West Palm Beach presented his research at SEAMAMMS. These markings are not to be used in lieu of the dorsal fin for ID , but as additional identification, especially when a dorsal is missing or severely scarred.



1) melon mark. 2) eye line. 3) eye patch. 4) fin line. 5) pre -cape and 6) rostrum irregularities

THE DOLPHIN PROJECT P.O. Box 60753 Savannah, Georgia 31420 thedolphinproject@gmail.com www.thedolphinproject.org The Dolphin Project is an all-volunteer, non-profit research, conservation and education organization, founded in 1989, dedicated to the protection of wild estuarine Bottlenose dolphins and our shared environment. Tax ID# 58-1914176



912-657-3927

SPRING FESTIVALS—TDP Volunteers needed...



TDP needs help setting up our tent and displays starting at 1:00pm [1300] in Daffin Park, Savannah.

Our new tent was purchased before covid and hasn't been used since. It replaced our tent which was damaged during the storm that hit the Ogeechee Seafood Festival back in 2018. This will be the first time putting up this tent. We have directions—in English!

If you can volunteer for 3 hour shifts, we would be greatly appreciative. If you can stay longer—all the better. There will be food trucks available for nourishment.



JOIN US FOR COASTFEST ON EARTH DAY

10 A.M. - 4 P.M. • SATURDAY, APRIL 22, 2023 FREE EVENT AT MARY ROSS PARK • BRUNSWICK

PROGRAMS • WILDLIFE • ACTIVITIES TOUCH TANKS • CANNON FIRINGS FISHING • FREE FUN FOR ALL AGES

Georgia www.DNRCOASTFEST.org



About CoastFest

CoastFest, in its 28th year, is the largest outreach event hosted by the **Coastal Resources Division** of the Georgia Department of Natural Resources. This free, family-friendly event features educational programs, touch tanks, wildlife viewing opportunities, and exhibitors from partner agencies and nonprofit organizations.

There's plenty to see and do for people of all ages at CoastFest. Whether you're interested in fishing, sea turtles, birds of prey, or Coastal Georgia history, we have something for you! Bring your family, curiosity, and sense of adventure when you "Catch the Excitement" at CoastFest on Earth Day from **10 a.m. to 4 p.m. Saturday, April 22, 2023,** at Mary Ross Waterfront Park in Brunswick, 100 F St., Brunswick, GA 31520.

CoastFest is a **free-admission** event and will happen rain or shine. We can't wait to see you there!

Volunteers needed for hosting TDP booth at COASTFEST. Fortunately we do not have to install our tent; we'll be sharing a huge tent with other non-profits. We still need to be setup by 8:30am [0830]. We'll have our vertical banners, fin-match game and brochures to hand out. We're not permitted to sell anything.

If you can volunteer for a 3 hour shift, it would be greatly appreciated. If you can come for the day—awesome!

Please let Peach know if you can help.

Future of captured Orca, Lolita, announced ...



More than 50 years after the orca known as Lolita was captured for public display, plans are in place to return her from the Miami Seaquarium to her home waters in the Pacific Northwest, where a nearly century-old, endangered killer whale believed to be her mother still swims.

An unlikely coalition involving the theme park's owner, an animal rights group and an NFL ownerphilanthropist who announced the agreement during a news conference Thursday.

"I'm excited to be a part of Lolita's journey to freedom," Indianapolis Colts owner Jim Irsay said. "I know Lolita wants to get to free waters."

Lolita, also known as Tokitae, was about 4 years old when she was captured in Puget Sound in summer 1970, during a time of deadly orca roundups. She spent decades performing for paying crowds before falling ill.

Last year the Miami Seaquarium announced it would no longer stage shows with her, under an agreement with federal regulators. Lolita, now 57 years old and 5,000 pounds, lives in a tank that measures 80 feet by 35 feet and is 20 feet deep.

The orca believed to be her mother, called Ocean Sun, continues to swim free with other members of their clan — known as L pod — and is estimated to be more than 90 years old. That has given advocates of her release optimism that Tokitae could still maybe have a long life in the wild.

"It's a step toward restoring our natural environment, fixing what we've messed up with exploitation and development," said Howard Garrett, president of the board of the advocacy group Orca Network, based on Washington state's Whidbey Island. "I think she'll be excited and relieved to be home — it's her old neighborhood."

The agreement — among Irsay; Eduardo Albor, who heads the Dolphin Co., which owns the Seaquarium; and the Florida nonprofit Friends of Toki, co-founded by environmentalist Pritam Singh — still faces hurdles to gaining government approval.

The time frame for moving the animal could be 18 to 24 months away, the group said, and the cost could reach \$20 million.

The plan is to transport Lolita by plane to an ocean sanctuary in the waters between Washington and Canada, where she will initially swim inside a large net while trainers and veterinarians teach her how to catch fish.

Survey Crews!!!!

Gratitude to those who have participated on dolphin Photo ID research surveys in 2023:

Carl EricssonTim INicole Neininger **MarkTom WorkmanJennSandy WorkmanLyn IJoyce Albrecht ***RuthPeach HubbardLiz FLisa Martineau

2023 CALENDAR...

Tim Dunbar ** Mark Harrington Jennifer Harrington Lyn Ryter Ruth Goldstein Liz Rothman



| APRIL | | | AUGUS | <u>ST</u> | |
|-------------|----------|--|---|------------------------|---------------------------------------|
| | 01 | ZOOM Training Workshop | | 12 | ZOOM Training Workshop |
| | 21 | Savannah Earth Day | 19 SEPTEMBER 16 23 OCTOPER | 19 | Research SURVEY |
| | 22 | Research SURVEY | | <u>MBER</u> 16 | Research SURVEY |
| | 22 | GA-DNR Coastfest. Brunswick22 Research SURVEY | | ZOOM Training Workshop | |
| MAY | | | | 14 | SkIO Marine Science Day |
| <u>JUNE</u> | 06 20 | ZOOM Training Workshop Research SURVEY ZOOM Training Workshop | | 20-21 | Great Ogeechee Seafood Festival |
| | 20 | | | 21 | Research SURVEY |
| | 10 | | | TBA | ZOOM Training Workshop |
| | 24 | Research SURVEY | NOVER | 04 | ZOOM Training Workshop |
| JULY | | | | 18 | Research SURVEY |
| | 15 | ZOOM Training Workshop | DECEM | <u>IBER</u> | |
| | 22 | Research SURVEY | | 02 | Richmond Hill Christmas Parade/Market |

Please mark your calendars with these dates so you don't forget them. They are also posted on our website.

As soon as you know you might be available for a survey, please sign up; especially skippers! If something comes up, you can always cancel. TDP can't conduct Photo-ID research without boats and crews on the water.

Invite your friends to attend a ZOOM Workshop! It offers a wealth of information about the local Bottlenose and our coastal environment. We're always looking for research crews. Like any volunteer organization, there is a turn-over in membership. People retire, move away or have health issues. We always welcome new members who care about their coastal environment and are interested in meeting like-minded folks.

The Dolphin Project Education Outreach Program is available for in-person school programs and club meeting in 2023. If you know of a club or school that would like a dolphin program, contact Peach. We're also available for STEM and STEAM nights and CAREER Days at schools. Contact us now to schedule fall school programs.

Fin whale with scoliosis

A massive 40-ton fin whale swimming off the coast of Valencia in Spain has been filmed with a severe bend in its 17-meter-long body (56 feet) in what appears to be a pronounced case of scoliosis. At first, when the skipper of a local boat caught sight of the poor creature from afar, it seemed to be struggling to swim, as though caught in the web of a fishing net.



Once biologists and veterinarians

arrived on the scene it became clear the whale's condition wasn't quite what they expected, with drone footage revealing a sharp deviation in the animal's spine about halfway down its body. The fin whale's disorder looked so severe, it seemed to have thrown off its entire anatomy, <u>according to a Facebook post</u> from the Oceanografic Foundation in Valencia (Fundación Oceanogràfic de València), which sent the rescue team. Biologists were hoping to attach a tracker to the whale, but the malformation in its spine made that impossible.

After a few hours, the fin whale left the coastline, swimming with difficulty. Scoliosis among whales is rare, but when it does occur, it tends to draw our attention. In 2019, a <u>minke whale with a clear curve in the</u> <u>spine</u> was tragically found washed ashore, allowing researchers the chance to study the anatomical impact of scoliosis in whales up close. Their <u>findings</u> suggest a shared mechanical basis for scoliosis in humans and in whales. Humans can sympathize with the painful condition more than any other mammal. We are the only species known to spontaneously develop scoliosis without any obvious underlying cause, what is termed <u>'idiopathic' scoliosis</u>.

Our anatomy reduces rotational stability to distribute weight more easily for bipedal movement, which means our spines can bend out of shape relatively easily without any obvious cause. Whale anatomy, on the other hand, provides these marine giants with vertebral columns that are less prone to bending out of shape under the strain of posture and usage than our upright spines.

In the case of the fin whale from Valencia, it's unclear how its spine got to be so deformed. With global shipping traffic on the rise the chance of an encounter with a powerful ocean vessel could explain its condition. Estimates suggest <u>up to 20,000 whales</u> die from collisions with vessels globally each year, and <u>most of these collisions involve</u> fin whales, the second largest mammal in the world and one that spends quite a bit of time near the surface of the ocean. Humpback whales are the next most common victim.

Just last year, a humpback whale with a broken back was <u>tracked by drone cameras</u> as it swam all the way from northern British Columbia to Hawaii. "The harrowing images of her twisted body stirred us all. She was likely in considerable pain yet she migrated thousands of miles without being able to propel herself with her tail," <u>reads</u> a press release, published by BC Whales on Facebook at the time.

"Her journey left her completely emaciated and covered in whale lice as testament to her severely depreciated condition. This is the stark reality of a vessel strike, and it speaks to the extended suffering that whales can endure afterwards. It also speaks to their instinct and culture: the lengths whales will go to follow patterns of behavior." While injury could be the cause, congenital abnormalities of this kind in whales aren't unknown.

In 2005, for instance, an orca in British Columbia was <u>reportedly</u> born with scoliosis, impacting his ability to swim and hunt. His pod seemed to pull back on the speed and length of their escapades to account for the whale's reduced speed and endurance. The underlying reason for the creature's congenital abnormality is unknown, but sadly, he died relatively young.

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Fin whale with scoliosis, continued

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BC Humpback whale with scoliosis

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A similar congenital abnormality <u>can also impact dolphins</u>. In fact, a bottlenose dolphin with scoliosis was <u>filmed a</u> <u>decade ago</u> swimming along with sperm whales, as though it had been adopted by the pod.

Moments like these are a cruel reminder that even when cetaceans aren't killed by ship collisions, the consequences are lifelong.

SPERM WHALES 'ADOPT' DEFORMED DOLPHIN - YouTube

Toothed whales use 'vocal fry' to hunt for food, scientists say

Coen Elemans was waiting for his flight to take off at the Copenhagen Airport. Numerous safety and passenger announcements cascaded out of the intercom. "They normally never say anything at this airport!" observed <u>Elemans</u>, a bioacoustician at the University of Southern Denmark. "They're very vocal today." He says the airport is as good a place as any to listen to the different ways people vocalize.

"What I hear is a lot of people talking," he notes. "They're mostly using what's called the chest register." That's our typical speaking voice. Then, Elemans notices some music playing. It's the situation where we most often hear our higher-pitched vocal register on display — falsetto.

We also have a lower register, below the frequency range where we usually talk. That's vocal fry. In English, it's usually regarded as an affect — something that changes the emotion or attitude of what's said. Certain people are known for it, like <u>Kim Kardashian</u> or <u>Leonard Cohen</u>. In other languages like Danish, Elemans says it alters the meaning of words.

We produce all these sounds — the vocal fry, the chest voice, and the falsetto — by sending air across our vocal folds in the larynx (a structure that allows air to pass from your throat to the rest of your respiratory system). And the vocal folds vibrate differently for each register.

"In a vocal fry register," explains Elemans, "your vocal folds are mostly slack, so they're thick and heavy, and they vibrate at their lowest frequencies. And in the falsetto register, they're stretched very long and the tension is very high. And this leads to the highest frequencies."

Elemans wondered whether a similar thing might be at play in toothed whales (like bottlenose dolphins, orcas, and pilot whales) to allow them to produce their diverse array of vocalizations. Such sounds range from whistles to bursts (the sounds we associate with Flipper) to echolocation clicks — the sound pulses used to hunt for prey. These clicks operate "more or less like a flashlight," says Elemans, "to search their

"Vocal fry" continued...

environment with a very focused beam."

Toothed whales have a larynx but it doesn't produce sound. Rather, they evolved a "new structure that's located in their sinus that generates the sounds — what's called phonic lips," says Elemans.

For decades, it's been hard to observe the phonic lips in action. The technology hasn't been up to the task and we can't yet observe the whales at the depths where they often feed. But Elemans and his colleagues developed several experiments to peek inside these animals. They <u>report</u> their findings in the latest edition of the journal *Science*.

First, they lowered an endoscope into the blowholes of a few trained, captive dolphins and porpoises. The small camera didn't need to go deep; it just had to get to where it could film the phonic lips at high speed. "And we show that there's definitely movement of the [lips] while they make echolocation clicks," summarizes Elemans.

For their next experiment, they needed animals that had recently died.

"That's really difficult," explains Elemans. "Typically when they die, they sink. So it's very hard to study their physiology because you don't have access to fresh tissue."

But Elemans and the others worked with marine mammal stranding networks, especially in Germany, to collect harbor porpoises that had died in the wild. Then then blew air across their phonic lips.

"What we've been able to show," says Elemans, "is that these phonic lips [are] not moved by muscle control like, for example, in cat purring. But instead, they're made just like a human voice by airflow. And that's a really striking parallel."

Additional experiments involving vocalization analysis and a kind of CT scan suggested that toothed whales likely have separate vocal registers that generate their numerous sounds, just like we do.

On top of that, the different registers have different functions. For instance, through audio recording the sounds of wild animals during their dives (by attaching acoustic tags to individual animals) as well as those of trained porpoises and dolphins, the research team determined that it's the vocal fry register that's responsible for echolocation in toothed whales.

"The strength of this work," says <u>Kelly Benoit-Bird</u>, Science Chair at the Monterey Bay Aquarium Research Institute, "is that it reconciles field observations of [toothed whale] sounds and laboratory studies of physiology with our understanding of the evolution of marine mammals to provide a clear, complete picture of how dolphins produce the wide repertoire of sounds that is critical for their survival."

Benoit-Bird, who wasn't involved in the study, points to the way the researchers tackled this scientific challenge from a variety of angles. "This work took all the fragments of the puzzle, figured out exactly how they fit together, and filled in the gaps, finally making the picture of dolphin sound production clear," she says. <u>Agnese Lanzetti</u>, an evolutionary biologist at the University of Birmingham who was not part of the research, agrees. "This is the very best research that shows how the sounds are made mechanically," she says, "and to prove that these sounds are generated by air."

The physics of air in the bodies of toothed whales plays out differently than it does for us on land. When an animal like a sperm whale dives a few thousand feet below the surface of the water, its lungs collapse under the pressure. But inside the bony structure of the nose, air can continue to move around and power echolocation.

"By moving all the air into the sinus," says Elemans, "these toothed whales are able to generate much higher pressures to drive the system. And with that, they can make basically the loudest sounds any animal can make on the planet."

And more importantly, feed themselves in the process — turning vocal fry into fish fry

March 14, 2023 by Sarah Haselhorst

Researchers have identified thousands of microplastics in the gastrointestinal tracts of four bottlenose dolphins that once swam near the Charleston Harbor. Found inside the dolphins were clear fibers from fishing lines, plastic tire particles, and tiny pieces of Styrofoam.

Each of the four stranded dolphins had about 1,400 microplastic items inside their gastrointestinal tracts, according to a group of researchers supported by the National Oceanic and Atmospheric Administration's National Centers for Coastal Ocean Science.

Beyond the sheer number of microplastics caught in the dolphins' stomachs and intestines, the research sends a message about what increasing development and a growing population are doing to marine health, said **Austin Gray**, head researcher and assistant professor of biological sciences at Virginia Tech. It also raises questions about whether problems suffered by marine life indicate threats to humans as well.

"If we are polluting our waterways and different organisms, whether certain people value them or not, we are being impacted," Gray said. What's clear is that if something doesn't change to reduce the amount of microplastics ending up in waterways, the number ending up in the stomachs of everything from fish to large mammals will increase, researchers say.

Breaking down the process

In 2020, former College of Charleston graduate student Francesca Battaglia was the first to report microplastics in North American Bottlenose dolphins. Years before, local research had indicated that a person walking along the Charleston Harbor shore would encounter a piece of plastic every two steps, according to Gray. Plastic makes its way into the water, breaks down and ultimately ends up in in the stomachs of fish, dolphins and other marine life. Gray said that of the fish tested in the Charleston Harbor, 99% had microplastics in their guts. Studying dolphins was the next move to see what microplastics were moving up the food chain.

Gray and research partner **Wayne McFee**, who is the head of coastal marine mammal assessments at NOAA's National Centers for Coastal Ocean Science, joined forces to continue looking at the effects of dolphins' microplastic consumption. In a five-year study, they're tracking whether there is an increase of plastics in the animals' stomachs over time and what the foreign objects could be doing to marine mammals' physiology. Their work begins with finding stranded, dead dolphins. NOAA contractor and University of South Carolina graduate student **Bonnie Ertel** collects the mammals and brings them to the Hollings Marine Lab in Charleston, where the dolphins' intestinal tracts are removed. Researchers then apply a potassium hydroxide solution to the intestines and let it sit for a few days, which works to break down organic matter. What's left behind is what doesn't degrade — inorganic matter. Gray said most inorganic matter they are finding are plastic polymers.

They count, characterize and look at the leftover particles under a microscope to see which shapes and sizes are most prevalent. Gray takes a sharper look at his lab at Virginia Tech, selecting a subset to analyze to identify the type of plastic polymers lodged in the dolphin's gut. In the first year of the study, they've found one microplastic that makes up 35% of those found in the dolphins: polypropylene. The plastic fiber, magnified, shows up clear and string-like, and it mostly comes from fishing line and gear.

How'd it get there? The dolphin either ate fish that were full of the microplastic, or the mammal consumed it directly from the water. McFee anticipates researchers will see a rise in the number of microplastics in the dolphins' intestinal tracts. He pointed to several factors: Climate change, and increased population and development. With more flash flooding predicted as the climate changes, whatever is on land will wash into the water, McFee said. Charleston's growing population also contributes. "The more people you put out there, the more people use plastics, the more chance of plastics getting into the water," he said.

Dolphins with microplastics...continued

More people means more cars. As they are driven, tires break down, shedding little pieces of rubber that inevitably gets washed from a street or a bridge and into the Cooper and Ashley rivers. While they found 1,400 microplastic particles on average in their first round of dolphin testing, Gray said preliminary results are trending closer to 2,000 microplastic particles.

Dolphin and human impact

McFee and Gray can't draw definitive conclusions about how dolphins are affected by microplastic consumption, as their research mostly focuses on microplastic consumption over time as Charleston's population and development grows. However, McFee said microplastics are known to potentially hurt reproduction. He's found that female dolphins who ate microplastics while pregnant passed those particles to their fetuses.

Microplastics have also been found in unweaned dolphins, who are only drinking their mother's milk, McFee said. However researchers are uncertain if the unweaned dolphins are getting microplastics from the milk, which they are just beginning to test. While there is no research on it, McFee suspects that if unweaned dolphins are getting microplastics from their mother's milk, the same could potentially be true of humans.

"Dolphins are the closest marine animal we can study as far as being a good surrogate for human health as well," McFee said. "We eat the same food that they do as far as seafood is concerned." In March 2022, Environment International reported for the first time that microplastics were identified in human blood at a concentration of 1.6 micro grams per milliliter. "That tells you there's an abundant amount of microplastics that have been documented with the human blood," Gray said. "One of the major routes of exposure is through ingestion ... and ingestion typically tied to seafood items."

How do we lessen the amount of plastics that ends up in waterways? Gray said an outright ban isn't realistic. But putting mechanisms in place to capture microplastics before they're released into water sources is possible. He pointed to legislation proposed in California requiring new washing machines to have microfiber filtration by 2029. Something like a single nylon fleece jacket can leave behind about 100,000 microfibers in one wash, which is ultimately disposed into the environment. A washing machine microfiber filter, whose cost ranges between \$30 and \$150, can capture those fibers. Beyond collecting microplastics before they leak into waterways, people can work harder to collect plastic waste and debris that, when discarded, break down into microplastics.

"What we do as humans in our activities has a direct impact on the environment," Gray said.

Don't forget to sign up to volunteer for Photo-ID dolphin research surveys Our success depends on YOU.

Check your calendars. For surveys—it's first come / first serve due to limited space on boats.

We also need to get the word out to the public about protecting the estuarine dolphins and our shared environment. Please volunteer at festivals and community events.