

# “ON EFFORT”

## Newsletter

### Summer 2016

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KAREN Stack	Treasurer
SANDY Workman	Vice President
MARY Cirincione	Secretary

#### DIRECTORS

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TOM Workman	CHRIS Hines
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Data Review -2	LORI Muskat
EDU– Coast	PEACH Hubbard
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Facebook	GAYLA Jones
Grants	CHRIS Hines
Membership	TOM & SANDY Workman
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Newsletter	PEACH Hubbard
NOAA Dolphin Conservation Program	RON Sattelle & TOM Workman
NOAA liaison	LORI Muskat
Publicity-GA	MAUREEN Morales
Publicity– Coast	
Socials	
Survey logistics	PEACH Hubbard
Training– ATL	MARGARET ANN Brown
Training—Coast	PEACH Hubbard
Website	

#### **THE DOLPHIN PROJECT**

**P.O. Box 60753**

**Savannah, Georgia 31420**

**[thedolphinproject@gmail.com](mailto:thedolphinproject@gmail.com)**

**[www.thedolphinproject.org](http://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

#### FROM THE HELM

Greetings Crew!

It seems that time is moving faster than ever this year. We're all so busy, it's difficult to fit everything in our schedules. I'm guilty and apologize for not getting a newsletter out sooner. There have been a lot of events this year beyond our normal trainings and surveys... SEAMAMMS in Savannah, environmental rallies, lectures, conferences and so on. Updates on these events are noted within this newsletter.

So pour your favorite beverage, get comfortable and catch up on The Dolphin Project news...

Thank you for your support.

*Peach*

#### TDP SURVEYS

**Sign up TODAY!!!!**

**AUGUST 13th**

**SEPTEMBER 17th**

**OCTOBER 8th**

**NOVEMBER 12th**

Your participation in our research surveys affords us to add more residential dolphin data to our database at DUKE University. Marine scientists rely on this data for health assessments and their research studies. Your support is critical.

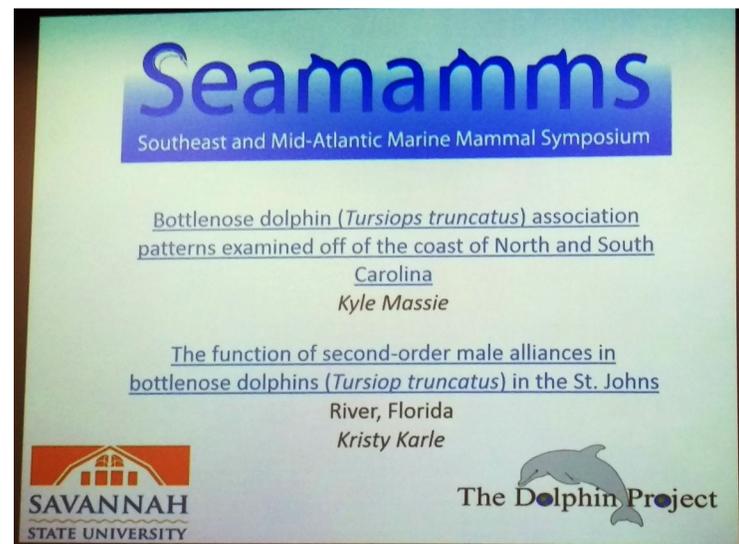
While the summer heat has been oppressive on land, the winds on the coast have made the surveys tolerable and even pleasant—so join us!

## SEAMAMMS 2016

The Southeast And Mid-Atlantic Marine Mammal Symposium was held—for the first time— in Savannah and co-hosted by Savannah State University and The Dolphin Project. SEAMAMMS is an annual event that is held at various locations from Virginia to Florida, typically at Universities or marine mammal labs at government agencies such as NOAA. In Virginia it was held at the Virginia Aquarium. SEAMAMMS is an opportunity for marine science students, from undergrad to PhD, to present their research studies. Noted marine science experts can offer advice. Often these noted experts present their research projects as well. The Studies can be in oral or poster form.

SEAMAMMS has been an enormous resource for TDP to enhance the training and educational outreach programs through our connections and collaborations with marine science experts from the Smithsonian down to Texas. Most of the presentations are about the SE coastal marine mammals. However some of these marine science students conduct research on the Pacific coast and in other countries. Occasionally the chemical analyses and biological data can be too much to grasp by those of us who are not tuned in to such things, but one has to admire the determination and dedication of those young folks.

On Friday night, a welcome party was held in the Speakeasy at the Savannah Distillery. The attendees loved the locale which made for a festive atmosphere. The food was delicious as well. Saturday night we held a banquet at the historic Pirate House. The food was so good, I even had a piece of the awesome fried chicken for dessert! A pirate maid told of the Pirate House history, including the ghosts! The Conference was held on the campus of Savannah State University on Saturday and Sunday. Dr Tara Cox, Robin Perrtree and SSU marine lab students were gracious and helpful.



*Friday night welcome party at the SPEAKEASY in the SAVANNAH DISTILLERY.*

## SEAMAMMS 2016

*Right: Dr. Tara Cox, Dr. Damon Gannon and TDP member Penn Clarke at the Speakeasy, Friday night.*

*Below: Pirate maid entertains at the Pirate House on Saturday night.*



On Sunday, besides additional oral presentations, awards were given to outstanding orals and posters for undergrad and graduate levels. A special award was given to Chance Mckennie, high school sophomore from Pooler, GA. (pictured to the right with TDP's Tom & Sandy Workman) This was a first for SEAMAMMS!—a presentation by a high school student. Chance has been attending SSU's coast camp for years. He presented a research poster "Analyzing Behaviors of the Common Bottlenose Dolphins in Savannah". Poster presenters also have to orally support their presentations. Everyone was VERY impressed by this young man.



*TDP members:  
Peach Hubbard,  
Tom Workman,  
Sandy Workman,  
Kate Young &  
Mary Cirincione.  
Not pictured:  
Susan Hall*

## SEAMAMMS 2016



*SEAMAMMS co-hosts: Robin Perrtree and Dr. Tara Cox of SSU & Peach Hubbard of TDP*



*Dr. Rob Young of CCU with Dr. Anne Pabst and Dr. Bill McLellan of UNCW*

SEAMAMMS 2017 will be hosted by Dr. Andy Read et al at Duke University, Beaufort NC. In 2018, it will be held at Coastal Carolina University, hosted by Dr. Rob Young, at their new marine lab in Conway SC. I'm very excited about attending future SEAMAMMS and visiting these universities again. ROAD TRIP!!! Join me!

*Peach Hubbard*

## 2016 TRAINING DATES

The next Saturday training dates are as follows:

**August 20, September, 17, November 5**

**10:30—1:00**

**Richmond Hill Library, Richmond Hill GA.**

Join us if you need a refresher or have a friend who would like to learn about the residential dolphins and The Dolphin Project.

RSVP: [thedolphinproject@gmail.com](mailto:thedolphinproject@gmail.com)

## 2016 FALL FESTIVALS ... VOLUNTEERS NEEDED

Volunteers are needed to man the booths at upcoming fall festivals. These events afford The Dolphin Project the opportunities to educate the public and recruit survey team members, so they are critical to the success of The Dolphin Project.

Each venue is different. Some have more elaborate displays, some are minimal. Some venues permit us to sell merchandise. This gives us a chance to not only educate the public through the books we sell, but to make a profit. The venues that supply electricity will have our flatscreen TV with looping dolphin video and fin-match game. Depending on location and space allotted, we also have a "ocean clean-up" game (folks "fish" for plastics on an ocean-themed shower curtain laid on the ground).

These festivals are fun not only for those attending but for the volunteers as well. Please check your schedule and sign up for one or more shifts at one or more festivals.

**RSVP: [thedolphinproject@gmail.com](mailto:thedolphinproject@gmail.com)**

**September 14      11am -2pm (one shift)**

**ARMSTRONG UNIVERSITY VOLUNTEER FAIR, Savannah GA**

**October 1            10am-4pm**

**COASTFEST, Georgia DNR HQ, Brunswick GA**

#1 shift: 9-12:30; #2 shift: 12:30-4:15

**October 14-16      FRI: 5-11, SAT: 10-11, SUN: 11-5**

**GREAT OGEECHEE SEAFOOD FESTIVAL, Richmond Hill GA**

Volunteers will receive festival passes.

FRIDAY... #1 shift: 3:30-6:30; #2 shift: 6:00-8:45; #3 shift: 8:30-11:30

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#4 shift: 6:30-10:00

SUNDAY... #1 shift: 10:30-2:00; #2 shift: 2:00-5:30

**October 22-23      SAT:10-5; SUN 10-4**

**HISTORIC BLUFFTON ARTS & SEAFOOD FESTIVAL, Bluffton SC**

SATURDAY... #1 shift: 8:30-12:00; #2 shift: 11:30-3:00; #3 Shift: 2:30-5:30

SUNDAY... #1 shift: 9:30-1:00; #2 shift: 12:30-4:30

**October 22            12-4pm            Savannah**

**MARINE SCIENCE FESTIVAL, Skidaway Institute of Oceanography,**

#1 shift: 9:30-1:00; #2 shift: 1:00-4:30

## TDP at CHILDREN'S MUSEUM 'SPLASH FEST'

The Dolphin Project was invited to participate in the Coastal Heritage Association's Splash Fest at the Savannah Children's Museum on Saturday, July 23rd. TDP volunteers, Belinda & Daniel Walters, Lana Haman, Barbara Lacey, Cheryl Tilton, Sandy and Tom Workman and Kate Young survived the heat to entertain hundreds of children and educate folks about ocean pollution and protecting dolphins. They hosted a booth with the 'Ocean Clean-Up Game'. Children can 'fish' plastics out of the 'ocean'.

The Dolphin Project was featured on WTOC TV and



## 'SONIC SEA' DOCUMENTARY

If you were unable to attend TDP's July 16th social or watch the **SONIC SEA** on the Discovery channel, you missed an amazing opportunity to learn about the noise in the ocean—the good and the bad. Sonic Sea is an award winning documentary that gives the facts about ocean acoustics. Amazing stories from people who have dedicated their lives to protecting the earth's oceans. I was astonished to learn the distance that noise travels underwater. I always knew it traveled faster and farther than in the air but to learn the facts blew me away. There are horrific consequences to shipping noise, sonar, seismic testing, blasting and other anthropogenic underwater noises. There are also solutions. To learn more about the SONIC SEA, go to:

<https://Vimeo.com/141970886>

<https://www.youtube.com/watch?v=T-abL64UZE&feature=youtu.be>

We're posting more about the SONIC SEA and ocean noise on our website.



## DID YOU KNOW?....

More than 90% of the inhabitable space on earth is in the open ocean!

More than 70% of the earth's surface is covered by ocean!

Algae that live in the upper open ocean (epipelagic zone) are responsible for much of the original food production for the entire ocean and create at least 50% of the oxygen in the atmosphere (both through photosynthesis).

More than 50% of the earth's surface is covered by ocean that is at least 2 miles (2.3km) deep!

The deepest known ocean depth is nearly 11,000m (36,000 feet or almost 7 miles)!

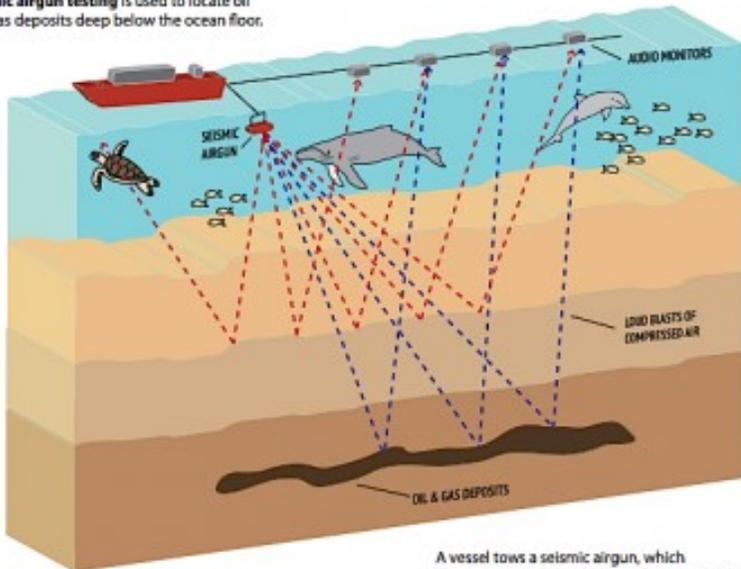
# OFFSHORE DRILLING-NO, SEISMIC TESTING-YES????

On April 14, twenty eight marine scientists called on President Obama to cancel planned seismic testing for oil and gas off the Atlantic coast in order to protect endangered right whales. This week Blue Frontier outreach intern and environmental law and policy graduate, Jennifer Magee, explains why.

## The Seismic Threat *By Jennifer Magee*

In the aftermath of President Obama's decision to postpone proposed oil and gas drilling in the Atlantic, coastal communities are still grappling with the looming threat of underwater geological and geophysical activities by the energy industry as a means of continuing to prospect for oil and gas.

Seismic airgun testing is used to locate oil and gas deposits deep below the ocean floor.



A vessel tows a seismic airgun, which shoots extremely loud blasts of compressed air through the ocean and miles under the seafloor, every ten seconds, 24 hours a day, for days to weeks on end.

The Federal Bureau of Ocean Energy Management (BOEM) is currently reviewing applications from at least eight different companies to perform seismic airgun testing along the Atlantic coast between Delaware and Florida. The surveys, conducted through an array

of airguns trawled behind a ship, repeatedly blast bursts of acute noise composed of compressed air every 10-15 seconds. These bursts move through the water column and up to 40km below the seabed, before the signal is reflected back, helping to determine if deposits of oil and gas exist under the sea floor.

Seismic surveys are deeply concerning because of the considerable noise generated by their activities and the impacts it will have on the Atlantic's marine life if approved. When emitted in water, sound is amplified and sustained impacting animals over significant ranges. Most companies with applications submitted have stated they will incorporate a "soft-start" or "ramping up" approach, where the noise is increased gradually over a period of 20-30 minutes while Marine Mammal Observers (MMOs) look for signs of mammals breaching in proximity to the testing area.

I spoke with marine acoustician Michael Stocker, Executive Director of Ocean Conservation Research, who stated that the idea behind this approach is that marine mammals will leave the area upon hearing the noise. However, he calls it a "token gesture". Marine mammals have exhibited adverse behavior 150-200 km away from these surveys and Stocker notes that that MMOs will not be able to see animals surfacing at this distance since whales and cetaceans often surface for only a few seconds before diving again, also that the noise increases their stress levels. "When animals are in an area, they're not just taking a stroll, they have a reason to be there. So even if they were to leave the area at the start of ramp-up activities, they are being diverted from their intended migratory path".

Recently, North Atlantic right whale critical habitat was expanded to cover its northeast

feeding areas in the Gulf of Maine/Georges Bank region and southeast calving grounds between North Carolina and Florida, parts of their migratory patterns.

Offshore oil expert Richard Charter of The Ocean Foundation told me a story about seismic testing companies using dynamite in Alaska in the 1970's. The sound impulses resulted in "fish just floating to the surface"[dead]. However, while dynamite is no longer used, Charter warns that there is an alarming similarity between present-day airgun testing levels and those produced by dynamite. He explained how data collected from transducers, recording reflected sound during seismic activities, are plotted onto the graph of an oscilloscope. The spikes along the y-axis reflecting the recorded electrical signal are eerily similar to those plotted in the seventies when using dynamite.

Noise produced from these activities have been shown to disrupt an animal's ability to communicate with others, navigate, and perform biologically necessary actions such as finding prey, finding mates and avoiding predators; leading to what Charter refers to as an inevitable "dead animal." He points out that superimposing a map of the proposed seismic testing areas over the designated critical habitat areas of the North Atlantic right whale, results in the two matching up almost perfectly.

The proposed seismic arrays off North Carolina, Michael Stocker informed me, would have a force level of 247 decibels (dB). This is loud enough to be heard 1,500 km away. One complication with obtaining solid information on noise threshold levels and getting everyone to agree on a number, Charter explained, is that different animals have different levels of sensitivity to noise frequency and different frequencies can also damage different organs. Since the largest biological effects are caused by noise occurring in the same range that a particular animal uses, it is important to consider the wide spectrum of frequencies utilized by different species. Rockfish, for example, have shown great sensitivity to seismic testing at various levels. At the same time, many larger species of whales use lower-frequencies to communicate while cetaceans, such as dolphins, use higher frequencies.

Overall, the biological effects of seismic testing on marine animals have not been studied extensively and there is even less research on the effects on species lower in the food chain such as plankton and more sedentary bottom-dwellers. "The bottom line", Charter says, "is that we don't know exactly how far the noise can be heard or how far-reaching its effects are. The conservation community would be wise to utilize every legal power available to them to fight this thing."

## DONATION

The Wilmington Island Presbyterian Church Vacation Bible School contacted TDP about making a donation. They were having an ocean theme and we were a perfect fit. Peach Hubbard gave seven brief dolphin programs during the snack times for the VBS kids, ages 3 to middle school. The kids dropped their daily donations into two dolphin cookie jars which were provided by TDP. Girls had one; boys the other. The kids were given a variety of brochure about dolphin protection, an adoption form and TDP sticker. Their generous donation amounted to \$582 towards our education outreach program.

*Peach Hubbard accepts the donation at WIPC\_VBS*



## A WIN AGAINST NAVY SONAR TO PROTECT MARINE MAMMALS...

San Francisco.

The federal appeals court ruled Friday, July 15, 2016, that the U.S. Navy was wrongly allowed to use sonar in the nation's oceans that could harm whales and other marine life. The Ninth U.S. Circuit Court of Appeals reversed a lower court decision upholding approval granted in 2012 for the Navy to use low-frequency sonar for training, testing and routine operations. The five-year approval covered peacetime operations in the Pacific, Atlantic, and Indian Oceans and the Mediterranean Sea.

The appellate panel sent the matter back to the lower court for further proceedings. A message seeking comment from representatives of the U.S. Pacific Fleet in Honolulu was not immediately returned.

Sonar, used to detect submarines, can injure whales, seals, dolphins and walrus and disrupt their feeding and mating. The 2012 rules adopted by the National Marine Fisheries Service permitted Navy sonar use to affect about 30 whales and two dozen pinnipeds, marine mammals with front and rear flippers such as seals and sea lions, each year. The

Navy was required to shut down or delay sonar use if a marine mammal was detected near the ship. Loud sonar pulses also were banned near coastlines and in certain protected waters.

Environmental groups, led by the Natural Resources Defense Council, filed a lawsuit in San Francisco in 2012, arguing that the approval violated the Marine Mammal Protection Act.

The appellate court ruled 3-0 that the approval rules failed to meet a section of the protection act requiring peacetime oceanic programs to have "the least practicable adverse impact on marine mammals."

"We have every reason to believe that the Navy has been deliberate and thoughtful in its plans to follow NMFS guidelines and limit unnecessary harassment and harm to marine mammals," the appellate ruling said. However, the panel concluded that the fisheries service "did not give adequate protection to areas of the world's oceans flagged by its own experts as biologically important," according to a summary accompanying the court's decision.

## SEAFOOD ADVISORY

The **GEORGIA ENVIRONMENTAL 2016 SAFE SEAFOOD** program completed its first month with their new outreach person, Nicole Holt. The GEC grant application to the Savannah Presbytery was approved and additional resource were provided by the Georgia Department of Public Health. Over the past month, the GEC met with other agencies and interns working on similar projects. An expanded Safe Seafood program is being proposed for long term funding under Superfund.

The following two pages contain a seafood advisory for the SE coast of Georgia.....

# Reduce Risk from Fish You Catch and Eat

## Fish Age & Size

Generally, older and larger fish may be more contaminated than younger, smaller fish.



## Cooking Methods to Reduce Risk

### GOOD

Broiling  
Baking  
Grilling

### OKAY

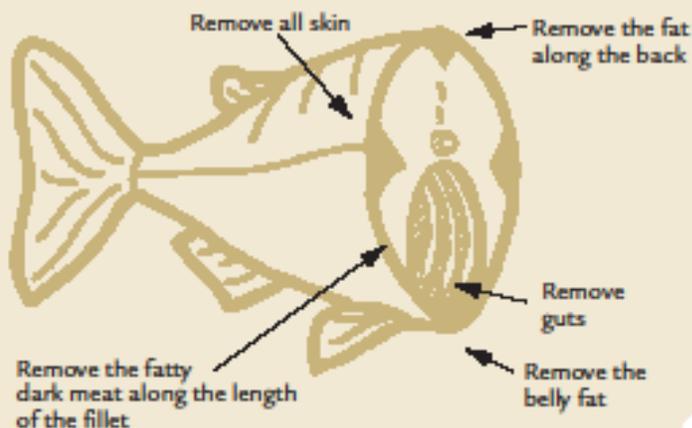
Deep-fat frying  
(do not reuse oil)

### POOR

Pan frying



## Fish Cleaning to Reduce Risk



Removing skin and fatty areas reduces some contaminants by 25 to 50% but does not remove mercury.

## Women and Small Children

Children under seven and women who are pregnant, nursing, or may become pregnant should:

- not eat mullet from advisory areas
- limit meals of fish and blue crabs to one per month from advisory areas

Don't stop eating fish and seafood. They provide one of the best sources of protein and Omega-3 fatty acids. Get seafood from other sources than advisory areas.



## For More Information

# GEC

Glynn Environmental Coalition

Glynn Environmental  
Coalition  
P.O. Box 2443  
Brunswick, GA 31521  
(912) 466-0934

# COASTAL HEALTH DISTRICT

Glynn County Health Department

Glynn County  
Health Department  
150 Scranton Connector  
Brunswick, GA 31525  
(912) 262-2300

# GEORGIA

COASTAL RESOURCE DIVISION

Georgia Department  
of Natural Resources  
One Conservation Way  
Brunswick, GA 31520  
(912) 262-7218

Program support provided by:

# MAREX

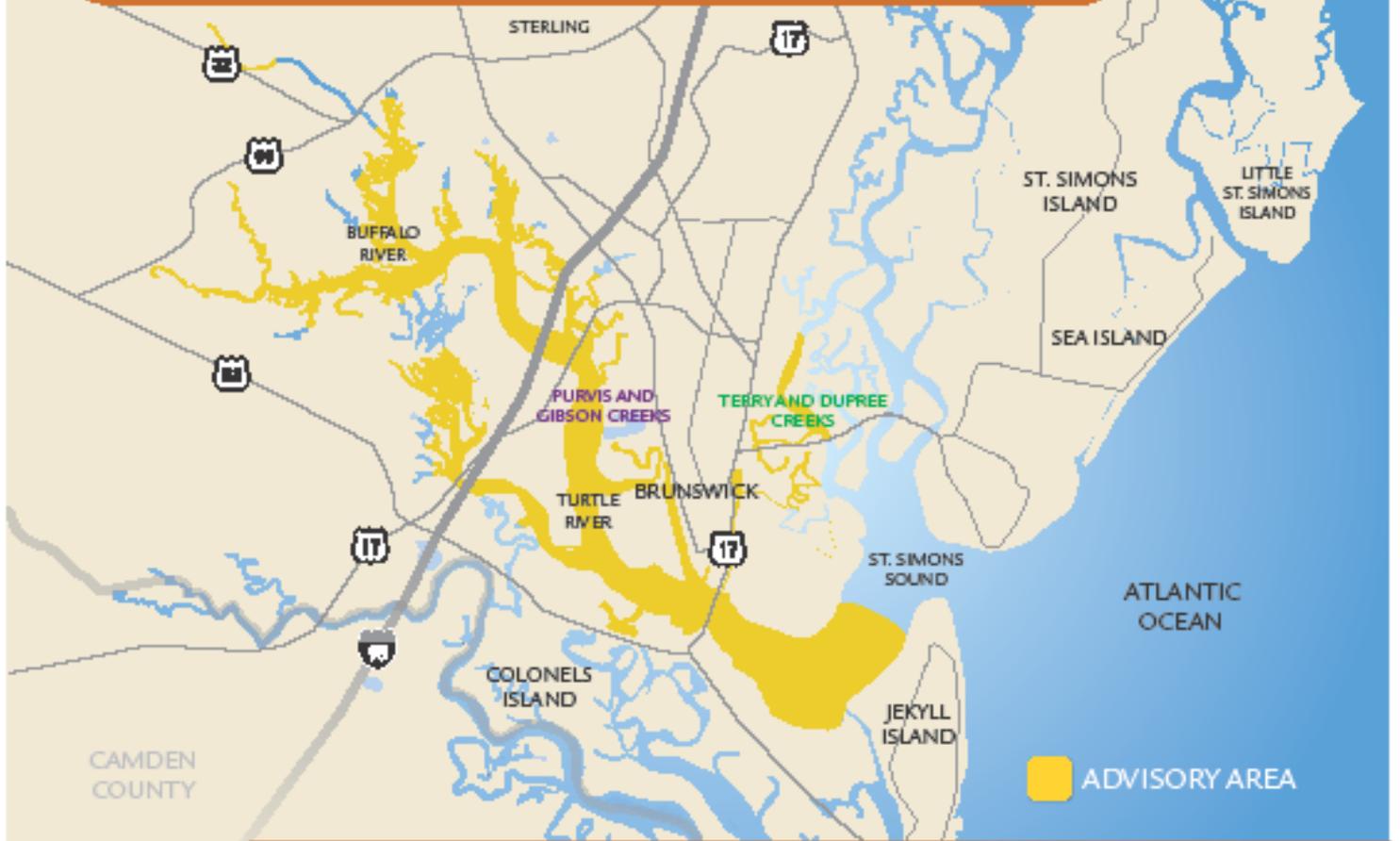
The University of Georgia Marine Extension Service

Public Service & Outreach  
THE UNIVERSITY OF GEORGIA

# Sea Grant

Coastal

# Glynn County Advisory Area for Fish You Catch and Eat



## Consumption Guidelines for Advisory Area

### NO LIMIT - EAT AS OFTEN AS YOU LIKE



### EAT ONLY ONCE PER WEEK



### EAT ONLY ONCE PER MONTH



\**Purvis and Gibson Creeks and the adjoining area of Turtle River: Eat Shrimp only once per month; Do not eat Atlantic Croaker, Spot, or Striped Mullet. Terry and Dupree Creeks: Do not eat Spot. Buffalo River: Do not eat Striped Mullet.*

Printed August 2011.

Fish illustrations by Dianne Rome Peebles, used with permission from the Florida Department of Environmental Protection. Design: mPrintDesign.com

## BP's LATEST GULF VICTIMS

### "Pregnant dolphins apparently suffered chronic illnesses after exposure to oil from the 2010 Deepwater Horizon explosion."

By Alan Neuhauser. Staff writer for US NEWS.com April 12, 2016



*A young bottlenose dolphin surfaces in the Gulf of Mexico. Bottlenose dolphins have been dying at a record pace in the womb or shortly after birth in parts of the gulf affected by the 2010 Deepwater Horizon oil spill.*

COURTESY NOAA

Six years on, the BP Deepwater Horizon disaster is still claiming victims. More than 170 stillborn and juveniles bottlenose dolphins found stranded in recent years along the Gulf Coast were likely killed by oil from the April 2010 explosion of the BP oil drilling rig—the worst maritime oil disaster in US history (according to a new study by NOAA / National Oceanic and Atmospheric Admin.).

This study determined that pregnant dolphins were far more susceptible to late-term pregnancy failures, in-utero infections and fetal distress compared to control groups.

Scientists observed a spike in stranded stillborn and juvenile dolphins along Alabama, Mississippi and Louisiana shores from 2010 to 2013.

“Our new findings add to the mounting evidence from peer-reviewed studies that exposure to petroleum compounds following the Deepwater Horizon disaster severely harmed the reproductive health living in the oil footprint in the northern Gulf of Mexico”, said veterinarian and study co-author Teri Rowles, head of NOAA’s Marine Mammal Health and Stranding Response Program. The oil’s long term effects on dolphin’s reproduction remains unclear.

More than 1,400 dead dolphins and whales have washed up on the Gulf’s shores since the disaster, far more than the average before the disaster. Federal officials have declared an ‘unusual mortality event’ (UME) for cetaceans in the region which remains ongoing.

Previous studies established apparent connections between the BP disaster and the sharp rise in dolphin and whale deaths. In May 2015, a research effort revealed that bottlenose dolphins in the regions were far more likely to have severe damage to their lungs and adrenal glands—injuries that were consistent to exposure to petroleum products, according to researchers.

This new study, published in the journal, ‘Diseases of Aquatic Organisms’, was released a week after a federal judge approved a \$20 billion settlement to end years of lawsuits related to the BP disaster. It includes \$5.5 billion in civil penalties under the Clean Water Act—the largest ever. However BP will be able to write-off all but a quarter of the settlement on its taxes.

The explosion killed 11 crewmen aboard the oil rig. An estimated 168 million gallons of crude was dumped into the Gulf of Mexico.

# GEORGIA'S SEA TURTLES ARE BREAKING RECORDS!

The Georgia Department of Natural Resources is responsible for managing and protecting sea turtles in the state of Georgia, USA. Georgia DNR's Sea Turtle Conservation Program has several components including management, monitoring, research, and education. More specifically, cooperators locate and protect sea turtle nests (~150 km of coastline), document strandings, perform necropsies on dead strandings, work with the Georgia Sea Turtle Center to provide rehabilitation for live strandings, conduct research, provide technical expertise on anthropogenic activities that have the potential to impact sea turtles (i.e., nourishment, dredging), and conduct education and outreach activities.



The Georgia sea turtle nest count is currently

3,221 and rising. To compare previous years: 2015: 2,333 nests; 2014: 1,205; 2013: 2,313 and 2012: 2,245. Hatching will take place through the end of September. The hot temperatures indicate that more female than male hatchlings will be born.

**DNA Samples Assigned: 711 (22.1%)**

**Unique Females: 454 (analysis incomplete)**

**Nests: 3221 (3209)**

**In Situ: 2351**

**Relocated: 870 (27%)**

**Incubating: 2517**

**Emerged: 224**

**Inventoried: 387**

**Lost: 90 (2.7%)**

**Unknown: 3**

**Excluded: 9**

**False Crawls: 3738**

**First Nest: Cumberland (Loggerhead) 2016-05-03**

**First Emergence: St. Catherines (Loggerhead) 2016-07-03**

**Last Nest: Cumberland (Loggerhead) 2016-07-29**

**Last Emergence: Jekyll (Loggerhead) 2016-07-29**

**Estimated Eggs to Date: 129817**

**Eggs Lost: 7876 (6%)**

**Hatched Eggs: 32863**

**Emerged Hatchlings: 31007**

**Mean Incubation Duration (all): 55.3 days**

**Mean Clutch Count: 111.4 eggs (Relocated Only)**

**Mean Hatch Success: 60.5%**

**Mean Emergence Success: 57%**

**Program Nest Success: 11.7%**

**Program Beach Success: 46.2%**

## BEACHES 101

Most people are very familiar with beaches. Beaches are fun places where people enjoy the intersection of very different terrestrial and marine environments, and millions of tourists visit beaches every year. Even people who have never visited a beach have likely seen a photograph or video of one, making beaches one of the most recognizable marine ecosystems. Though they are often thought of simply as empty expanses of sand, beaches are actually lively ecosystems with most of the life hidden from the human eye.

Beaches occur in areas where fairly strong wave action deposits sand, and a lack of strong currents prevents it from being carried away. Sand can either be geological or biological in origin. Geological sand is a result of the weathering of rocks. Biological sand comes from the breakdown of coral skeletons, shells, and other hard body parts from marine plants and animals. Many beaches consist of a mix of these two types of sand. A beach's slope is important in determining what sorts of organisms live there. Much of the marine life that lives on beaches is buried in the sand within the intertidal zone (the area that is underwater at high tide but exposed at low tide), so beaches with larger intertidal zones have larger areas for those organisms.

Clams and other shellfish, crustaceans, and numerous types of worms all live buried in the sand. These species are able to survive the low tide because small amounts of water is trapped between sand particles, even when the area is exposed. During the high tide, soft-bottom predators (like rays and some sharks, flatfishes, croakers, and other species) patrol beaches for small fishes and mobile invertebrates that come

into the intertidal zone to feed on buried invertebrates. During the low tide, shorebirds pick through the sand to find their preferred invertebrate prey, a demonstration of the amphibious nature of this ecosystem. Sea turtles and some shorebirds utilize beaches as nesting sites, and some foraging land mammals hunt on beaches at night. Because sand moves around quite a bit, unlike soil, there is very little vegetation on sandy beaches. However, sea oats and other coastal plants successfully grow on sand dunes (large hills of sand located above the high water mark), and palm trees and some other plants survive at the intersection of sand and soil above low-energy, flat beaches.

Unlike coral reefs, mangrove forests, and several other marine ecosystems, beaches are not directly created by living organisms. Therefore, providing protection for beaches is different than for those other systems. Instead of developing legal protections for species, beaches often require area-based protection. There are some exceptions to this rule (for places with high

densities of protected sea turtle or shorebird nests, for example), but generally speaking, it is necessary to protect entire areas in order to protect the beach ecosystem. As beaches are one of humanity's favorite tourist destinations and beach tourism is highly valuable for coastal economies, closures are often lacking. In areas where protections are not in place, it is important to ensure that human impacts are minimized, by refraining from littering, removing living organisms, or disturbing the ecosystem in any excessive way.

OCEANA



**2016 DATES TO REMEMBER ... AND VOLUNTEER!**

***SURVEYS:*** AUGUST 13, SEPTEMBER 17,  
OCTOBER 8 , NOVEMBER 12

***TRAINING:*** AUGUST 20, SEPTEMBER 17, NOVEMBER 5

***EDUCATION OUTREACH / FESTIVALS:***

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