

RISING TIDE

THE MAGAZINE for YOUNG ANGLERS and CONSERVATIONISTS.

WHAT ARE BILLFISH?

We tell you how to tell them all apart on page 4!

**REEF
BALLS!**
PAGE 6



PLUS MORE!
Photos, Articles & Activities!

RISING TIDE

THE MAGAZINE for YOUNG ANGLERS and CONSERVATIONISTS

Coastal Conservation Association (CCA) is a non-profit marine resource conservation organization. It has been active in almost every national fisheries debate for decades and has been a driving force in state and federal fisheries management issues. With your continued support, CCA will continue to battle for the health and longevity of our coastal fisheries and for recreational anglers' interests in them.

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Ted Venker

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What's Inside:

What is a Billfish?

Marlin, sailfish, swordfish and more...we show you what makes it a billfish and the differences between them all!

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Reef Balls at Work

Learn why and how these artificial reef modules are a very effective way to create marine reef habitat.

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How to make "ocean glittering slime" and find out what fish species uses slime for protection.

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ON THE COVER>>

Sabrina Brame from Louisiana enjoys a spring break get away at Maverick Costa Rica (maverickcostarica.com) with her Grandfather. Here, Sabrina releases a beautiful Pacific sailfish offshore of the central Pacific region of Costa Rica on the Sea Fly, a 42' Maverick Yacht. Learn more about this beautiful species and his relatives on page 4! PHOTO BY WILL DROST.

LOWCOUNTRY EXPEDITION

OCEARCH
EDUCATE INSPIRE ENABLE

During February and March 2017, OCEARCH and its team of collaborating scientists embarked on their 28th expedition, to tag mature sharks in the Lowcountry, which included Georgia, South Carolina, and North Carolina. The team's goal was to gather data on the ecology, physiology, and behavior of white sharks in the Atlantic Ocean, and to increase the sample size of the research started in 2012 in Cape Cod, Massachusetts. This expedition used the OCEARCH Global Shark Tracker to gather near real-time data. In addition to the data gathered with the Tracker, this expedition took BIOLOGICAL samples from the sharks, like blood, muscle plugs, reproductive fluids, fin clips, or parasites off of the shark.

"It's very unusual for us to see tiger sharks and white sharks at the same place. We're probably in an area here where two worlds are colliding. Tiger sharks like warmer temperatures and white sharks like cooler temperatures. It's cool to see."

- Expedition Leader Chris Fischer

Research projects during the expedition included:

- Shark movements in the North Atlantic, to look at their small and large scale movements, where they live, and feeding behavior
- How white sharks reproduce
- Impacts of white sharks on the marine food web of the western North Atlantic
- DNA sequence variation of white sharks within and among ocean basins
- Nutritional markers
- Bite force in sharks
- Contaminates of emerging concern from U.S. Atlantic waters

SAVANNAH

Species: White Shark
Gender: Female
Stage of Life: Immature
Length: 8ft 6in
Weight: 460 lbs
Tag Date: Mar 06, 2017

Description:

Savannah was named to celebrate the people of Savannah, GA. The OCEARCH team was humbled by their hospitality and passion for the ocean. Savannah was tagged during Lowcountry Expedition.



Meet the Lowcountry Expedition Sharks
All Tagged in Hilton Head, South Carolina



BEAUFORT

Species: Tiger Shark
Gender: Male
Stage of Life: Immature
Length: 5ft 7.5in
Weight: 107 lbs
Tag Date: Mar 09, 2017

Description:

OCEARCH looks forward to sharing their data so that the people of Beaufort and all over the U.S. can continue to monitor the migration of this immature tiger shark.



HILTON

Species: White Shark
Gender: Male
Stage of Life: Mature
Length: 12ft 5in
Weight: 1326 lbs
Tag Date: Mar 03, 2017

Description:

Hilton was named after the local community who has graciously welcomed us. Hilton was also tagged on the anniversary of Lydia.

WEIMAR

Species: Tiger Shark
Gender: Male
Stage of Life: Mature
Length: 9ft 4in
Weight: 304 lbs
Tag Date: Mar 03, 2017

Description:

Weimar was named after Ruth Weimar who generously hosted the OCEARCH team in Georgia. She connected us to Brunswick and Savannah.



WHAT ARE BILLFISH?

The term **BILLFISH** refers to a group of predatory fish characterized by prominent bills, or rostra, and by their large size. Billfish include sailfish and marlin (including spearfish), which make up the family Istiophoridae, and swordfish, the sole member of the family Xiphiidae. They feed on a wide variety of smaller fish, crustaceans, and cephalopods. Billfish are highly migratory and are found in all oceans, although they usually inhabit tropical and subtropical waters. Billfish use their sword-like upper beaks to slash at and stun prey during feeding. Their bills can also be used to spear prey, and have been known to spear boats (perhaps accidentally). They are a highly valued gamefish to recreational anglers like you!

1 The **Longbill Spearfish** is distinguished from other billfishes by its slender, lightweight body, short bill, and its high anterior dorsal fin. The ventral fins are located well in front of the anal fin, whereas in all other billfish they are located close to the anal fin. The bill is about twice as long as its lower jaw, but still quite short by billfish standards. The pectoral fins extend beyond the curve of the lateral line. The longbill spearfish has more segments (45 to 53) in the first dorsal fin than any other Atlantic billfish, although it may appear similar to the white marlin. The dorsal fin is bright blue and has no spots. The vertical bars on the body are never as prominent as in other billfish and may show only slightly or not at all.

2 The **Shortbill Spearfish** is likely the easiest of the billfishes to distinguish with a bill that is barely longer than its lower jaw. The dorsal fin of this species is high in the front, with a triangular peak that extends to a height greater than the entire body depth. The dorsal fin lacks spots and may even be brownish in color towards the tail end. Shortbill spearfish lack any bars or vertical stripes on their side. It can reach a maximum length of nearly 8 feet and some specimens have been caught in the 100 pound class. Most fish average out to roughly 35 pounds.

3 The **Sailfish**'s outstanding feature is the long, high first dorsal fin which resembles a "sail" and is a dark gray or cobalt blue with a scattering of black spots. The second dorsal fin is very small. The bill is usually a little more than twice the length of the lower jaw. The vent is just forward of the first anal fin. The sides often have pale, bluish gray vertical bars or rows of spots.

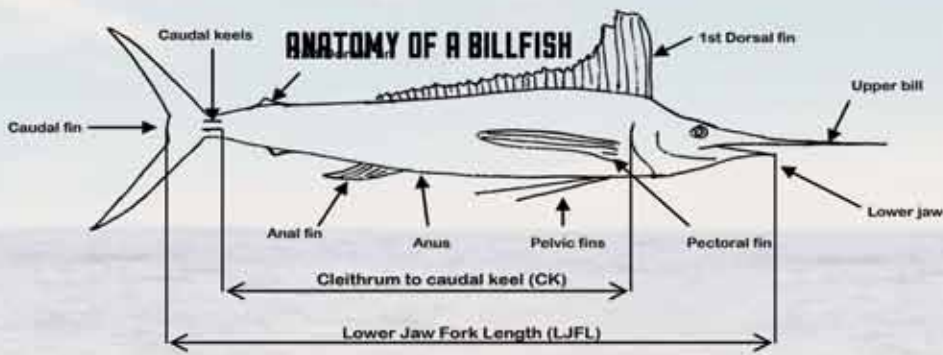
4 Typically the **Swordfish** has a smooth, very broad, flattened sword (broadbill) that is significantly longer and wider than the bill of any other billfish. It also has a non-retractable dorsal fin, rigid, non-retractable pectoral fins, and a single, but very large keel on either side of the caudal peduncle. Swordfish lack ventral fins. The back may be dark brown, bronze, dark metallic purple, grayish blue or black. The sides may be dark like the back or dusky in color. The belly and lower sides of the head are dirty white or light brown. It uses its sword for defense and to kill or stun food. Occasional attacks on boats have been authenticated by the recovery of swords found broken off in wooden hulls.

5 The **Black Marlin** can be quickly identified since it is the only marlin that has rigid pectoral fins that cannot be folded flat up against the body. It is also set apart by the tapered shape of the pectoral fins and by its very short ventral fins, which almost never exceed 12 inches in length. The first dorsal fin is proportionately the lowest of any billfish, usually less than 50 percent of the body depth. The body is more flat, rather than rounded, much more so than in similar sized blue marlin. The body is slate blue dorsally, changing abruptly to silvery white below the lateral line. When feeding or leaping, the black marlin may display light blue vertical stripes on the sides. Slight variations in color cause some specimens to have a silvery haze over the body.

6 The **Blue Marlin**'s dorsal fin is high and pointed anteriorly (rather than rounded) and its greatest height is less than the greatest body depth. The anal fin is relatively large and is pointed. The back is cobalt blue and the flanks and belly are silvery white. There may be light blue or lavender vertical stripes on the sides, which are typically only seen while fish is swimming. There are no spots on the fins.

7 The **Striped Marlin** has pointed dorsal, anal and pectoral fins. They are also flat and movable and can easily be folded flush against the sides of its body. Its sides are very compressed. The lateral line is straight, single and clearly visible. The back is grayish blue fading to bluish silver on the upper flanks and white below the lateral line. There are a number of iridescent blue spots on the fins and pale blue or lavender vertical stripes on the sides. These may or may not be prominent, but they are normally more prominent than those of other marlins.

8 The first dorsal fin of the **White Marlin** differs from any other marlin, in that both margins are convex. The flat, movable pectoral fins can easily be folded flush against the sides of the body. The lateral line is visible and straight. In overall appearance the white marlin is generally lighter in color and tends to show more green than do other marlins. Several light blue or lavender vertical bars may show on the flanks, especially when the fish is feeding or leaping. Some specimens have a scattering of black or purple spots on the first dorsal and anal fins.



LET'S COMPARE!





BUILDING CONSERVATION SPOTLIGHT

KIDS IN MARYLAND ARE USING REEF BALL TECHNOLOGY TO CREATE UNDERWATER HABITAT!

WHAT IS A REEF BALL?

Reef Balls are one of the best **designed artificial reef modules**. They are a very effective way to create sustainable marine reef habitat. Reef balls are easily made from a fiberglass mold system that can be supplied anywhere in the world. The round, hollow, vented and "bottom-heavy" form makes these modules extremely stable and they rarely ever move once placed. A reef ball is the perfect vessel to allow micro-organisms a place to land, burrow in, and mature before predators can feed on them.

When an artificial reef is "designed" it means that the reef has been both engineered to last against sea forces (chemical and physical) and shaped according to the organisms who will use them.



What began as a community project designed to play a role in habitat restoration, has gotten more than 1,000 students across the state of Maryland involved in habitat restoration activities.

Students begin in the classroom by learning the history of Chesapeake Bay eastern oysters and the important role they can play in restoration. Then, these classes get their hands dirty by constructing concrete reef balls that are later seeded with oyster spat and placed on the reef as a partner in CCA's Living Reef Action Campaign.

On July 28th, 2016, CCA and its National Habitat Program, Building Conservation Trust (BCT) deployed (or sank) 72 of these student-made reef balls (all seeded with oyster spat) on the Tilghman Island Reef Site in Maryland.

Only three months after placing the reef balls, divers found there were as many as 2,000 new oysters per reef ball! Even better, they will continue to develop and support marine life FOREVER!

This reef is not only providing habitat for amazing sea life, the oysters growing on them are helping filter the water of Chesapeake Bay! Oysters are filter-feeders which means they suck in the water around them, filter out the harmful pollutants they eat, then spit the water back out, free of that waste. A single oyster filters between 30 and 50 gallons of water each day! This improves water clarity, controls algae, and attracts other sea life.

More habitat for the marine life we love AND cleaner water for us all to enjoy - reef balls rock!

Building reef balls is just one of many ways kids just like you can improve or create marine habitat. Isn't it amazing to think that just by volunteering your time and maybe getting your hands a little dirty, you can make a huge impact on the health of our waters! Ask your parents to contact your local CCA chapter and see if there are any opportunities in your area to get involved!



Here hundreds of kids from Linton Springs Elementary School in Hampstead, Maryland are building reef balls as a partner in CCA's Living Reef Action Campaign project.



Reef balls are made by pouring concrete into a fiberglass mold containing a central inflated buoy surrounded by various sized inflatable balls to make holes. There are many different standard mold sizes and custom sizes are possible.



This reef ball was seeded with **OYSTER SPAT** two weeks before being deployed underwater.

WHAT IS OYSTER SPAT?

The life cycle of the oyster begins with a free-swimming larval stage that eventually attaches to a hard surface forming an **OYSTER SPAT**. The spat will continue to grow and eventually enter into the sub-adult, then adult phase of life.



This is the first dive of these reef balls to look at oyster growth, survival, and fish usage. Only three months after deployment, as many as 2,000 new oysters per reef ball were found! Plus, many other micro-organisms and sea life were discovered already using the reefs. In such a short time, these reef balls were covered in LIFE!

TRY THIS!

glittering ocean SLIME

We combined our love for slime and the ocean to make this fun and easy ocean-themed slime recipe.

FOR EACH BATCH OF SLIME (WE DID TWO DIFFERENT COLORS) YOU WILL NEED:

- 1/2 Cup of Elmer's Washable Non Toxic Clear Glue - white glue works too, but the color won't be as translucent.
- 1/2 Cup of Liquid Starch
- 1/2 Cup of Water
- Liquid Watercolors - you can also use food coloring, but liquid watercolors don't stain and make great color. For this slime we used the colors blue and bright green.
- Fine glitter - whatever color you like. We used silver.
- Small sea life figurines - optional



DID YOU KNOW?

Some Fish Create SLIME Cocoons to Protect Themselves from Parasites

Just as some people sleep with nets over their beds to ward off bugs, scientists have found that some coral reef fish seem to use the same concept underwater. Some research has found that certain species, such as the parrotfish (pictured left), apparently spin cocoons of "slime," or mucus, before slumbering to keep away biting parasites. These slime cocoons have long fascinated scuba divers and scientists are still researching this bizarre and slimy behavior.



Name That Disney Marine Life!



We all know Gill from Finding Nemo, but let's get to know the real fish that inspired the character...

MOORISH IDOLS, *Zanclus cornutus*, are one of the most iconic coral reef fishes around. The Moorish idol got its name from the Moors of Africa, who reportedly believed the fish to bring happiness. In Hawaii they are commonly known as "Kihikihi" which means "curves," "corners," or "zigzags," referring to its shape and color pattern. Wild specimens be up to 7 inches long, but 4 inches in length is more average size.

It is the only member of the family *Zanclidae*, and a very close relative of the Tangs or Surgeonfish. One of the most widespread fish, it can be found throughout the Indian Ocean, Red Sea, and all of the tropical Pacific.

Moorish idols are diurnal (active during the day) and may be seen alone or in pairs, occasionally forming large schools. Once an adult finds a mate, they stay together for life. The Moorish Idol tends to be very peaceful.

They are highly sought after for aquariums, but do not survive well in captivity because they are picky eaters - preferring live coral or rock and algae. So unless you're an expert fish caretaker, this species is better admired in the ocean or in a public aquarium rather than in a home tank.

MEET THE Moorish idol

ANGLERS LIKE YOU! KIDS

FISHIN'

**DO YOU HAVE A GREAT CATCH
THAT COULD MAKE
OUR KIDS FISHIN' PAGE?**

To submit photos, have your parents:

1. Email to photos@joincca.org OR
2. Share on Facebook at [Facebook.com/CCANational](https://www.facebook.com/CCANational)

* There are a lot of kids fishin' out there and while we try our best to get everyone's photo published, we cannot guarantee yours will be printed.

* Any photo with a child (under 13) not wearing a life jacket on a boat cannot be published, as we want to portray safe boating examples to all our readers.

Hunter



Christopher



Jayden

Wyatt



Cade



Thank you Shell!

Because of the generous support of Shell Oil Company,
the Rising Tide Youth Program will continue to thrive!



Townes



Hudson



Nik



Charlee



David



Cole

Townes



Andy




Will

Jack



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YOU are an important part of a
conservation organization of more
than 100,000 people who love
and care about fishing and the
health of marine life and habitat.
That makes **YOU**...a pretty cool kid.

