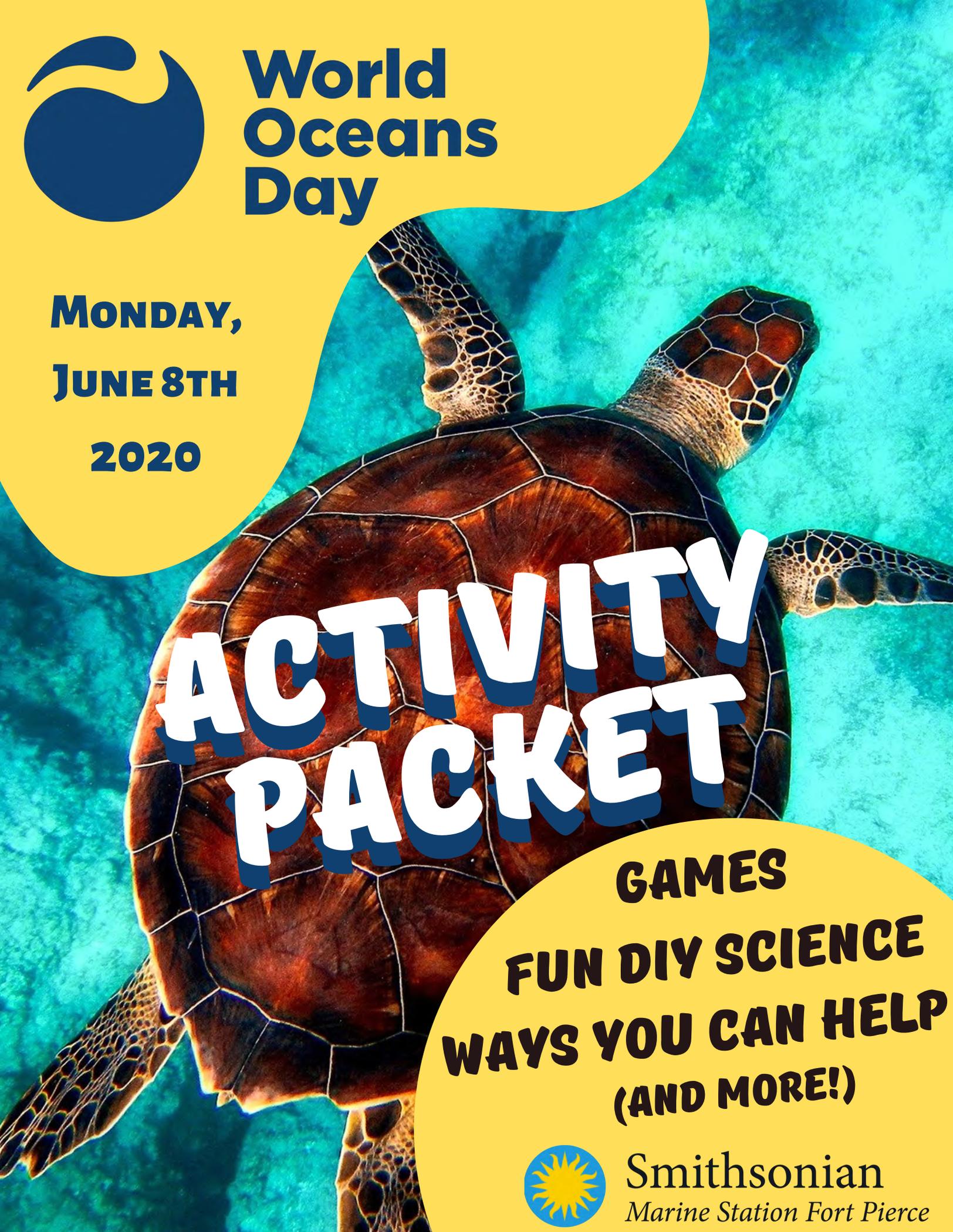




# World Oceans Day

**MONDAY,  
JUNE 8TH  
2020**



# ACTIVITY PACKET

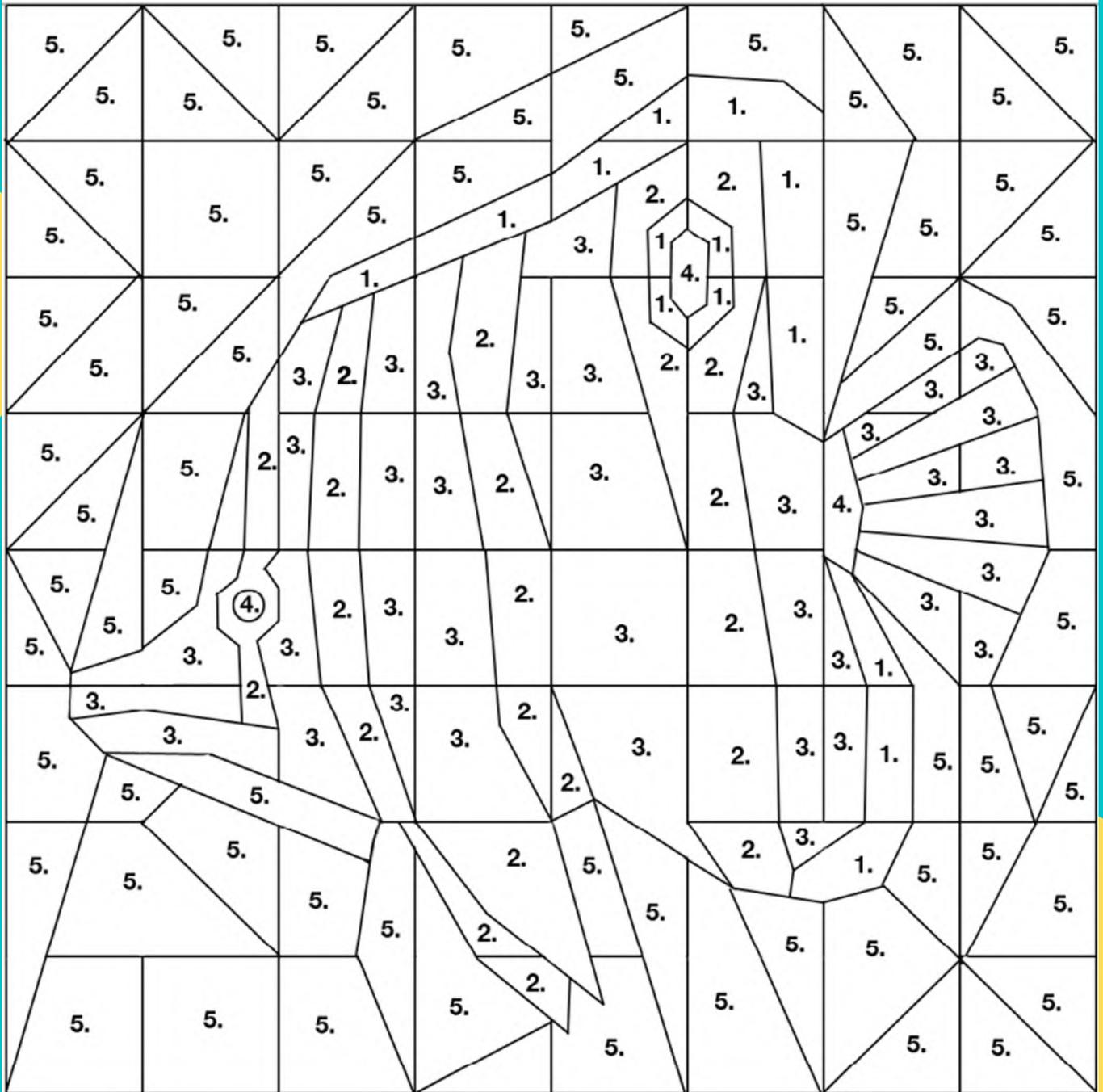
**GAMES  
FUN DIY SCIENCE  
WAYS YOU CAN HELP  
(AND MORE!)**



**Smithsonian**  
*Marine Station Fort Pierce*

# COLOR BY NUMBER

Color in the boxes below to reveal a colorful sea critter! Use the color guide below for each number!



- 1 - Orange
- 2 - Yellow
- 3 - White
- 4 - Black
- 5 - Blue

What is this colorful sea critter? It's called a butterfly fish!



# DIY SCIENCE AT HOME

# HOW DO SHARKS STAY BUOYANT?

Sharks are *buoyant*, which means they don't sink in the water. *Buoyancy* is the ability to maintain equilibrium in water or other liquid. Sharks have a few ways to stay buoyant. One way is by relying on their big, oil-filled liver. This science activity will explore how sharks use their oily liver to stay buoyant!

## MATERIALS NEEDED

- 2 small water bottles
  - Cooking oil
  - Water
  - Large container filled with water
  - Permanent marker
- {optional but fun to draw shark faces}

START HERE

## STEP 1

Fill one bottle of water with cooking oil and the other with water. Draw a shark face on the bottles if you'd like!

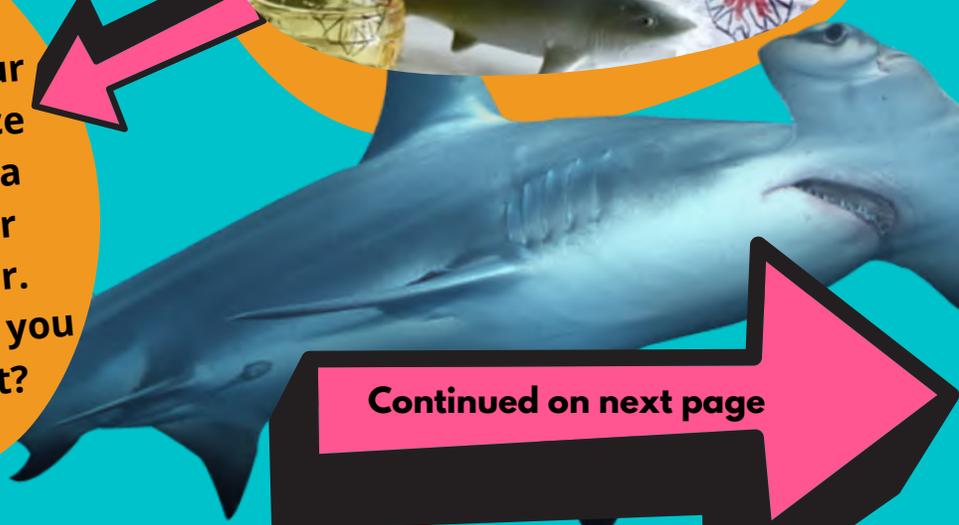


## STEP 2

Take both of your bottles and place them gently in a large container filled with water. Which bottle do you think will float?



Continued on next page



# HOW DO SHARKS STAY BUOYANT?

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## STEP 3

Did the oil-filled bottle float, while the water-filled bottle sank? Why do you think that is?



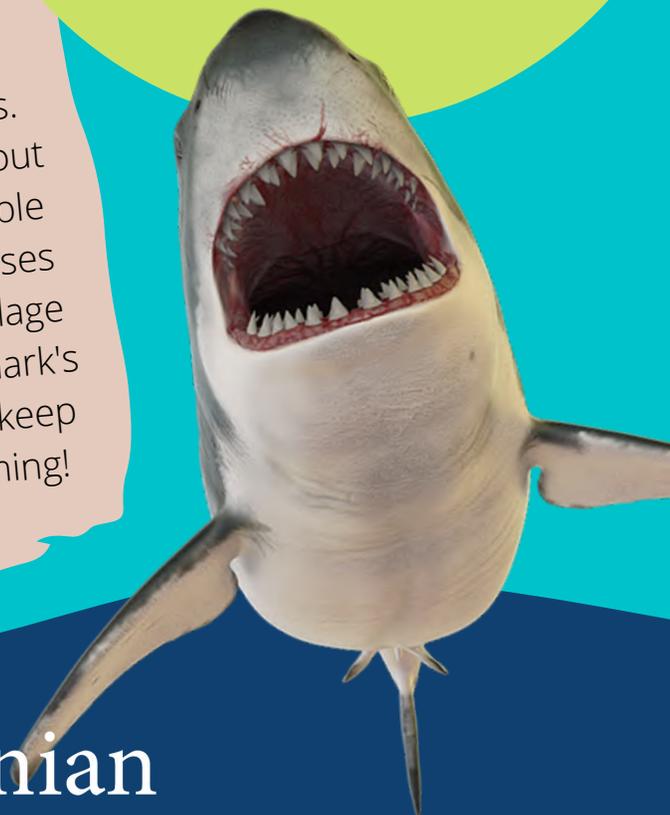
## IT'S BECAUSE OIL IS LIGHTER THAN WATER!

**Density** is a word we use to describe how much space an object or substance takes up in relation to the amount of weight in that object or substance. If an object is heavy and compact, it has a high density. If an object is light and takes up a lot of space, it has a low density. So, since oil is less **dense** than water, it floats and is one of the ways sharks are able to stay buoyant in the water!

## WHAT ARE OTHER REASONS FOR SHARKS BEING BUOYANT?



Sharks don't have bones like us. Instead, their skeleton is made out of **cartilage** - a somewhat flexible connective material that our noses and ears are made out of! Cartilage is lighter weight than bone. A shark's wing-like fins and tail also help keep the animal buoyant and swimming!



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# OCEAN ADVENTURE

# BEACH SCAVENGER HUNT

The next time you go to the beach, take this cool beach scavenger hunt with you! See how many items you can observe on the beach.

Remember, never take shells with living animals inside or pull living plants out of the sand! Keep our beaches beautiful and healthy!



Bittersweet clam



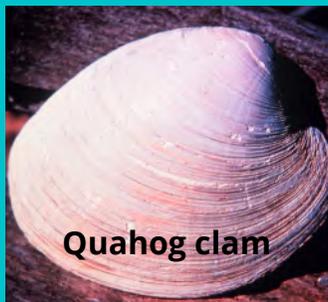
Seagrass tree



Sanderling



Ghost crab



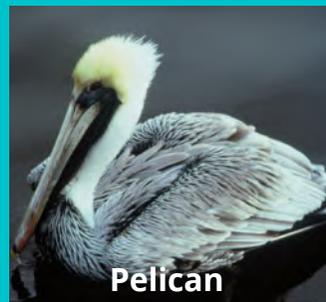
Quahog clam



Gull



Whelk shell



Pelican



Sargassum



Olive shells



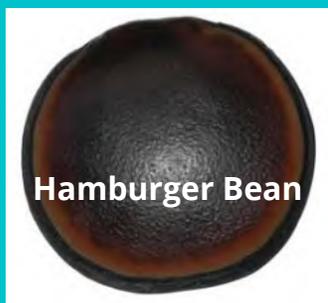
Cockle



Sand dollar



Sea oats



Hamburger Bean



Sabal  
palm



Whelk egg casing



World  
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Day

# MARINE PROTECTED AREAS

This year's World Oceans Day is growing the global movement to protect 30% of our blue planet by the year 2030. By safeguarding at least 30% of our ocean through a network of marine protected areas we can help ensure a healthy home for all!



## WHAT IS A MARINE PROTECTED AREA?

A marine protected area (MPA) is a special label for marine (saltwater) areas that are protected by law. MPAs help our oceans be more resilient to climate change, habitat degradation, and overfishing by protecting areas that are very important to maintaining healthy ecosystems.

**DID YOU KNOW?**  
MPAs cover less than 6% of oceans worldwide!

## The largest MPA in Florida is the **FLORIDA KEYS NATIONAL MARINE SANCTUARY**



Stretching from Miami to the Dry Tortugas, the Florida Keys National Marine Sanctuary protects over 2,900 square nautical miles of water, including North America's only coral barrier reef!

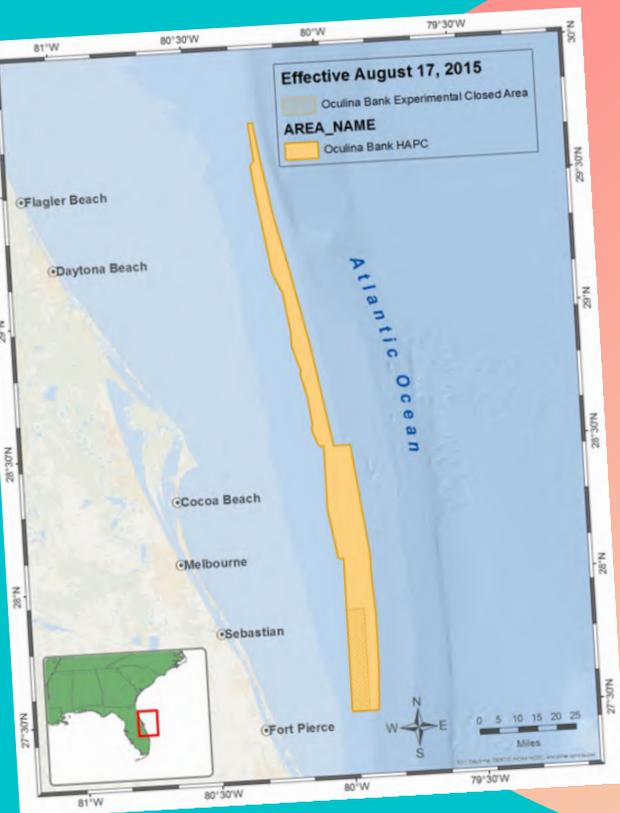
There are more than **6,000** species of marine life found in the sanctuary!





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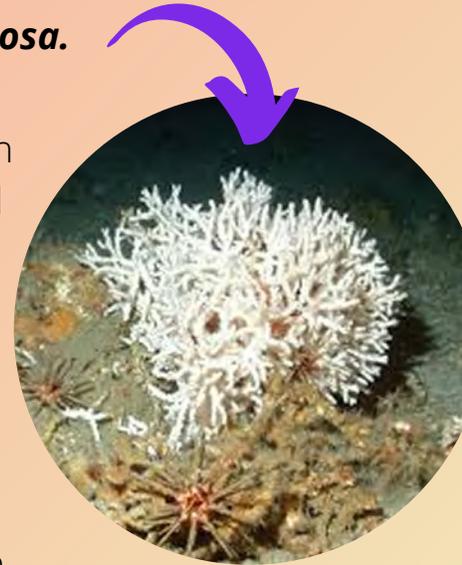
# OCULINA BANK: HABITAT AREA OF PARTICULAR CONCERN (HAPC) AND EXPERIMENTAL CLOSED AREA



Courtesy NOAA Fisheries

Located roughly 15 nautical miles off the coast of Ft. Pierce, Florida at a depth of around 300 feet, the Oculina Bank is a unique habitat that supports a species of deep-water coral known as *Oculina varicosa*.

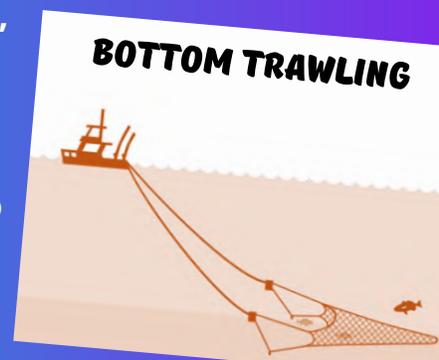
First discovered in 1975, the Oculina Bank is an important fish area, especially for snapper and grouper species. In 1984, the area was first protected as a Habitat of Particular Concern. It was expanded numerous times and now covers 130 nautical miles. In 1994, additional protections were given to the original 92-mile stretch and designated as an Experimental Closed Area.



## WHY DOES IT NEED PROTECTION?



This slow-growing coral, which only grows around a half an inch a year, provides habitat for hundreds of species of animals, including about 70 species of fish. Bottom trawling, which is a fishing practice where a net is dragged along the bottom of the ocean behind a boat, has been massively destructive to *Oculina varicosa* coral. The South Atlantic Fisheries Management Council created protected areas to preserve this incredible area of diverse marine life.



# DIY SCIENCE AT HOME

## MANGROVES VS. COASTAL EROSION

### WHAT IS COASTAL EROSION?

Coastal erosion is a process where water - driven by waves and wind - wear away sand, soil, and after many years, even rocks!



Although erosion is a natural process, removing shore-stabilizing plants like mangroves increases the rate of erosion, which can threaten our shorelines!

The root systems of mangroves, which grow in sand and sandy soil, hold the shoreline in place, preventing massive erosion that could lead to loss of natural habitat or even the homes of humans living near the water! **This experiment will show us how shore-stabilizing plants like mangroves prevent coastal erosion!**



### MATERIALS NEEDED

- Shallow pan, like a paint pan
- Sand
- Rocks or other somewhat heavy objects that can get wet (to use in place of mangroves!)
- Plastic bottle
- Water



### STEP 1

First, fill one half of your shallow pan with sand, making a steep slope in the middle.



**START HERE**

# MANGROVES VS. COASTAL EROSION

Page 2



## STEP 2

Now slowly fill the empty side of the pan with water. You can add blue food coloring to make it more realistic! Grab your plastic bottle and push it up and down to create waves on your shoreline. **Do this for one minute and observe what happens!**



**DID MOST OF YOUR SAND END UP GOING INTO THE WATER? NOW LET'S SEE WHAT HAPPENS WHEN WE ADD "MANGROVES"!**

## STEP 3

For this experiment, rocks or another non-floating object will take the place of mangroves. After scooping your sand back into a slope, place several rocks near the water and repeat the wave motion with the your water bottle.

**DID LESS SAND WASH INTO THE WATER?**

**Yes, because our "mangroves" absorbed much of the wave action and protected the coastline!**

Not only do mangroves help us protect the coastline, they are important habitats for thousands of plant and animal species that use mangrove areas for food and shelter. Mangroves are found all over the world, including three species here in Florida: red, white and black mangroves!





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Marine Station Fort Pierce

# HOW CAN YOU HELP THE OCEANS?

There are a lot of things YOU  
can do to help the oceans!  
Here's a few ideas:



## USE LESS SINGLE-USE PLASTICS

Single-use plastics are things like plastic bags, straws and water bottles. Did you know these are some of the most common pieces of trash in the ocean?



## EAT SUSTAINABLY-SOURCED SEAFOOD

Harmful fishing practices can lead to lower populations of fish, crabs and other animals in the oceans. By only eating seafood that was caught or reared in an environmentally responsible way, you can help protect ocean-dwelling animals!



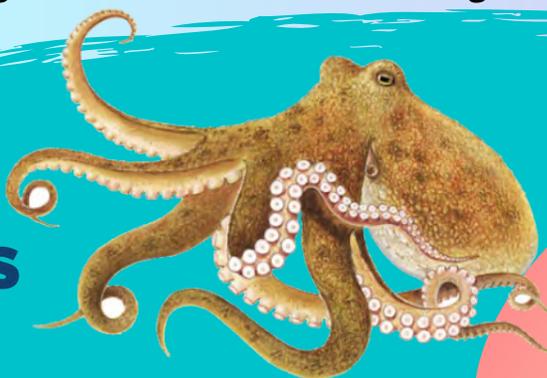
## PARTICIPATE IN LOCAL BEACH CLEAN-UPS

A lot of trash from the land can end up in our oceans. By keeping the beach free of trash, we can prevent it from entering the oceans and harming animal life.



## REDUCE YOUR ENERGY USE

Excess carbon dioxide from fossil fuels is absorbed by our oceans and can be harmful to ocean life, so whenever possible, ride a bike or walk instead of using a car! You can also turn off lights when you're not using them!



World  
Oceans  
Day

TAKE THE WORLD  
OCEAN'S DAY PLEDGE ON  
THE NEXT PAGE!



# TAKE THE WORLD OCEANS DAY PLEDGE!

Now that you know some ways you can help protect our oceans, take the pledge! Choose from any of the ways to help on the previous page, or create your own! Write it on the lines below and color in the picture to create your own special promise to help the oceans!

