



## TROPICAL DIVER

There are many different types of coral. They can generally be categorized, based on appearance, as hard coral (Order: Scleractinia) or soft coral (Order: Alcyonacea). Coral is actually an animal that is related to sea anemones and jellies. Coral reefs cover less than one percent of the ocean floor, however they support about 25% of all ocean life. As of 2011, about 60% of the world's coral reefs are at risk.



• Looking at the Pacific Barrier Reef wall, can you distinguish the differences between hard coral and soft coral?

• Can you name some of the different species that live in and around the coral reef?



### MEET AN EXPERT ON OUR STEAM TEAM

**DR. LISA HOOPES,**  
Nutritionist  
Texas A&M University  
Major: Wildlife and  
Fisheries Science



*What is the most exciting part of your job at Georgia Aquarium?*

The most exciting part of my job is the challenge of maintaining the nutritional health of thousands of different species, from the smallest urchins to the largest of whale sharks.

*What advice do you have for students interested in doing what you do?*

Read, explore and volunteer! Follow your passion. From the academic end, stay strong in math, chemistry and science as they will have direct application to day-to-day operations in an aquarium.

*What is something surprising or unexpected about your career path?*

I had planned to stay in a university setting and become a research professor, but a twist of fate and a job at a major zoological institution changed my mind. Afterwards, I applied and accepted the job at Georgia Aquarium. I have the best of both worlds in that I get to help care for a unique collection of animals at the Aquarium, and I get to continue to follow my research interests. I am currently working on research projects across the globe regarding a variety of aquatic species.

*What do you say to students who ask "Why am I learning this?"*

To understand how the world around you works and provide you with some insight and possible inspiration on a career in science. Very little is known about the nutritional requirements of many of these aquatic species in their natural environments. You could be the next scientist to help discover these unknowns!

[georgiaaquarium.org/STEAMForward](http://georgiaaquarium.org/STEAMForward)

## BOOKMARK IN YOUR BROWSER!

Bookmark these links in your browser to stay current with Education at Georgia Aquarium:

[georgiaaquarium.org/experience](http://georgiaaquarium.org/experience)

Get the lowdown on all of the exciting events happening at Georgia Aquarium!

[georgiaaquarium.org/learn](http://georgiaaquarium.org/learn)

Request more information for a school visit.

[georgiaaquarium.org/teach](http://georgiaaquarium.org/teach)

Explore our ever-evolving resource page to make Georgia Aquarium a part of your classroom!

[georgiaaquarium.org/STEAMForward](http://georgiaaquarium.org/STEAMForward)

Access our exciting new STEAM Forward video series that spotlights career pathways at Georgia Aquarium and our partners in the community.

[georgiaaquarium.org/SEA](http://georgiaaquarium.org/SEA)

Get your field trip funded today!

[georgiaaquarium.org/outreach](http://georgiaaquarium.org/outreach)

Can't make it to the Aquarium? Let us float on over to your school!



Connect With Us @GeorgiaAquarium on Social Media!

Blog: [georgiaaquariumblog.org](http://georgiaaquariumblog.org)



## EDUCATION



## FIELD GUIDE



### ANIMAL ADAPTATIONS GRADES 3-5

Three-quarters of Earth's surface is covered with water. There are many different types of aquatic habitats, such as the open ocean, coral reefs, lakes, rivers, marshes and swamps. To survive in these different environments, animals have special features, or adaptations. These adaptations have developed over time and serve several important purposes. They can help an organism get food, protect themselves from enemies, and survive in many different conditions.



## SOUTHERN COMPANY RIVER SCOUT

The electric eel (*Electrophorus electricus*) is the largest of the knifefish and can grow to be almost 8 feet long (2.5 m) and weigh up to 44 lbs. (20 kg). Olive to blackish in color, the scaleless electric eel is a fish with an elongated body and a flattened broad head. You will also notice a yellow or orange coloring near the throat region. It generally lives in murky water in pools, deeply shaded streams and creeks. It prefers the muddy bottoms of calm water throughout mainland South America. Adults feed on smaller fish and amphibians. The electric eel immobilizes its prey with an electric discharge. Additionally, this species is an obligate air-breathing fish that absorbs 80 percent of its required oxygen by taking air in through the mouth.



- The electric eel lacks many of the common fins (dorsal, caudal) found on the typical fish. Why is this an important adaptation for this particular species?
- Observe the electric eel's side-to-side movement. Look up and compare the electric eel to the smallmouth buffalo.



## AT&T DOLPHIN TALES

The **common bottlenose dolphin** (*Tursiops truncatus*) is found throughout the Atlantic. It is commonly seen in bays, tidal creeks, inlets, marshes, rivers and along open ocean beaches. Its fusiform shape (wide in the middle and tapered at the ends) allows for efficient swimming and diving. With an outer layer that sheds approximately every 2 hours, its tiny ridged skin is an adaptation specialized to reduce drag. The maximum observed swim speed of a common bottlenose dolphin was about 18 mph (29 km/hr) for a very short distance.



- Look closely at the bottlenose dolphins. What adaptations do you see? How do you think these adaptations help them survive?
- The bottlenose dolphin has an adaptation where an oily mucus is secreted to lubricate its eyes. Why is this important for a mammal that swims in the ocean?



## COLD WATER QUEST

The **African penguin** (*Spheniscus demersus*) is found along the southernmost coast of Africa, where water temperatures range between 40 and 70 degrees F (5-20 degrees C). The African penguin lives in colonies. Both the male and the female penguin look the same. Therefore, African penguins are not sexually dimorphic. Juvenile feathers are shades of grey with a lighter belly and chest. A penguin will keep their juvenile feathers for one year before changing to their adult plumage. As adults, they will have black feathers on their back with white feathers on their front. On occasion, the chest and belly may also have black markings. Penguin feathers are stiff and overlap in layers to trap air next to the skin for insulation. The feathers are very resistant to wind and water.



- What adaptations does the penguin have? Do you know of any other animals with similar adaptations?
- The penguin's wing bones are flatter and covered with scale-like feathers. Why is this a benefit for a flightless bird like the African penguin?



## OCEAN VOYAGER BUILT BY THE HOME DEPOT

The whale shark (*Rhincodon typus*) is the largest of all fishes. The average length for a whale shark is between 18 and 32.8 feet (5.5-10 m). These highly migratory fish are typically found offshore, in waters around the globe, feasting on a diet of zooplankton and small fishes. A whale shark may be recognized by the pattern of its spots. Like our own fingerprints, their markings help scientists identify individuals.



- A whale shark's teeth are tiny and pointed backward. What does this adaptation tell you about the feeding habits?
- The whale shark's skeleton is made out of cartilage. How does a cartilage skeleton differ from a bone skeleton?